

DIGITAL PHOTO CAMERA

DKC-ST5

VCL-1205BYS

SERVICE MANUAL

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare.

Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten.

Brukt batteri returneres apparatleverandøren.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreskrifter.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.

Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

VAROITUS

Paristo voi räjähtää jos se on virheellisesti asennettu.

Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.

Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.

Udskiftning må kun ske med batteri af samme fabrikat og type.

Levér det brugte batteri tilbage til leverandøren.

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SECTION 1 OPERATING INSTRUCTION

This section is extracted
from operation manual.

3-859-623-11(1)

SONY.

Digital Photo Camera

Operating Instructions

Before operating this unit, please read this manual thoroughly and retain it for future reference.

DKC-ST5

© 1997 by Sony Corporation

Owner's Record

The model and serial numbers are located at the rear. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

For the customers in the USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

Important Notice

Thank you for choosing the Sony DKC-ST5 Digital Photo Camera (referred to below as "the product"). The DKC-ST5 control software (referred to below as "the software") is included with the product as sample software in order to enable you to utilize the full potential of the product.

The software is provided under the following conditions.

1. The software and related documentation may not be reproduced, copied, modified, or revised in any manner, in whole or in part.
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About This Manual

This manual gives an overview of the DKC-ST5 Digital Photo Camera, and describes connections and installation, and the method of operation, principally with a remote controller.

Using the supplied control software

By installing the DKC-ST5 Control Software supplied with the product on two 3.5-inch floppy disks, you can control the DKC-ST5 from a computer. For details of the operation of the software, read the readme.doc file installed with the control software.

For details of the installation of the control software, see Chapter 5 of this manual.

System Features

The DKC-ST5 Digital Photo Camera is a high-quality electronic photography system, using a high-resolution CCD camera with a total of 1,400,000 pixels. This system can form the core of a studio portrait photography system, or can be used for a variety of applications in which still image are kept in a filing system.

A maximum of nine images can be held in memory. Stored images can also be transferred to a computer or color printer, for processing and printing.

The following are some of the principal features of the system.

High-resolution CCD camera head

The camera head uses a three-chip $\frac{3}{4}$ -inch high-resolution CCD with 1,400,000 total pixels.

Storage for up to nine images

Images can be captured into memory consecutively at about 1-second intervals. After checking captured images on a monitor, you can select the images for transfer to a computer.

Flexible color gradation representation

The A/D conversion uses a 10-bit lookup table, which makes for flexible color gradation representation.

Optimized dynamic range

Gamma correction and knee point adjustment allow the dynamic range to be optimized.

Special-purpose lens for smooth manual adjustment

The special-purpose lens (VCL-1205BYS) is available separately, and provides a focusing ring and zoom ring with a light touch, allowing for smooth manual adjustment.

Simple camera operation

The procedure for using the camera is similar to that for a conventional camera, so there are no particular problems for users unaccustomed to video cameras or digital devices.

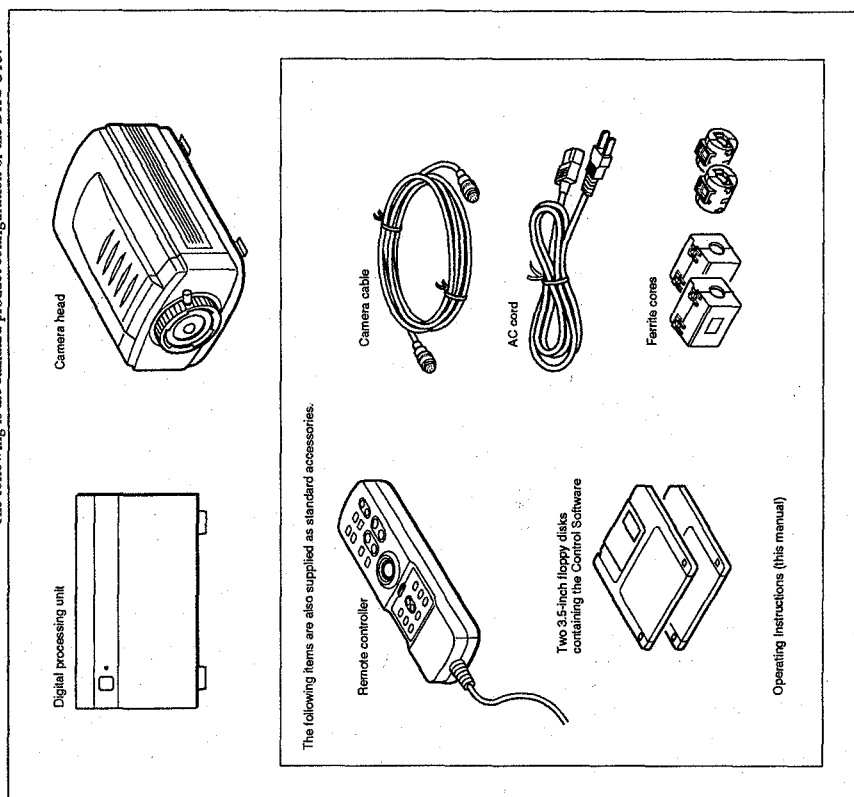
Lens mount

In addition to the special-purpose lens (VCL-1205BYS), you can fit any $\frac{3}{4}$ -inch 48-mm bayonet mount lens.

System Features

DKC-ST5 Standard Product Configuration

The following is the standard product configuration of the DKC-ST5.



In addition to the standard components, a lens, video monitor, and computer are required.

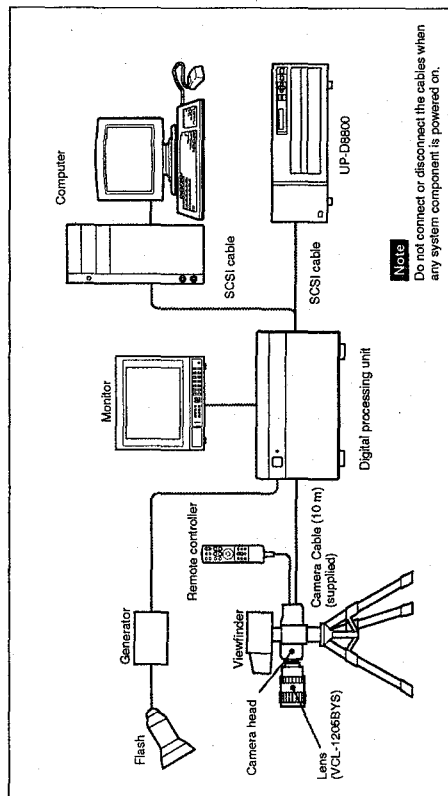
For details of the components required in addition to the standard product configuration, see the section "Principal Examples of Use" on the next page.

Principal Examples of Use

The following are examples of use of the DKC-ST5 Digital Photo Camera system.

Portrait system

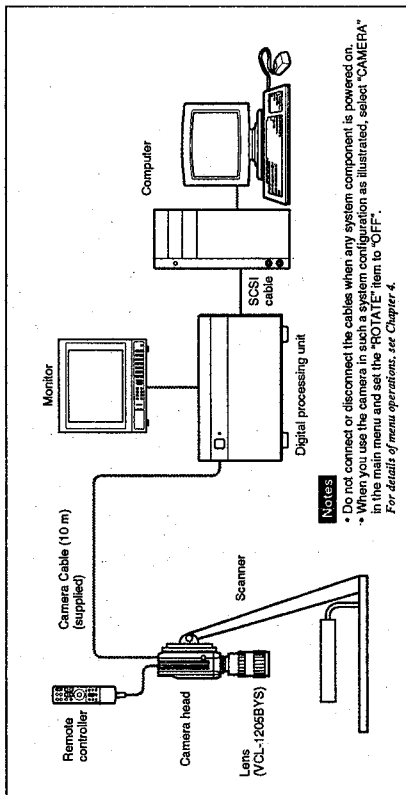
By combining a computer and a full-color printer, you can build an instant portrait system as shown below. You can capture a number of images into memory, review them on the monitor, then print a selected image.



System Features

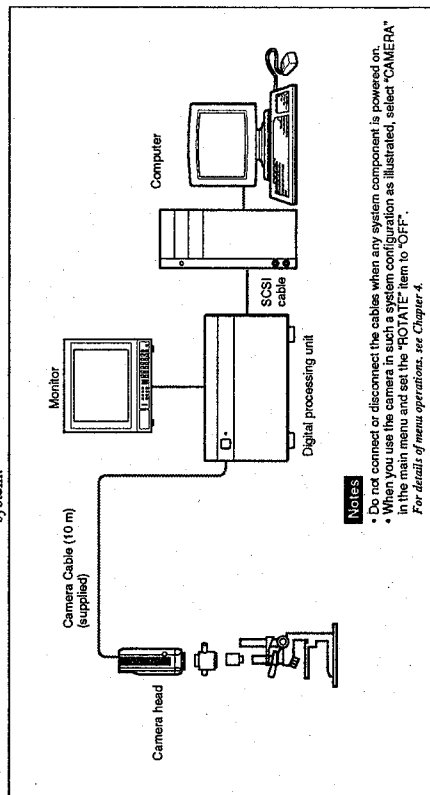
Still image filing system

In combination with a computer, you can create a still image filing system as shown below.



Medical image input system

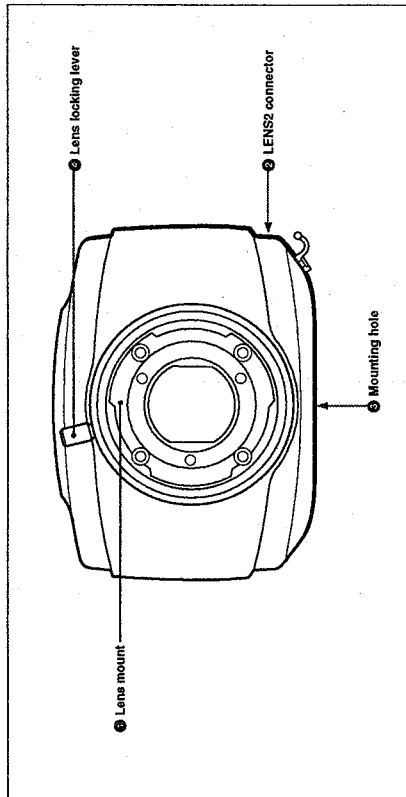
The camera head can be used with a microscope, in a medical image input system.



Location and Function of Parts

Camera Head

Front view



① Lens mount

Mount the lens here. With the back end of the lens inserted, press down the lens locking lever in a clockwise direction to lock the lens.

In addition to the special-purpose lens (VCL-1205BYS), you can fit any $\frac{1}{2}$ -inch 48-mm bayonet mount lens.

② LENS2 connector (12-pin, female)

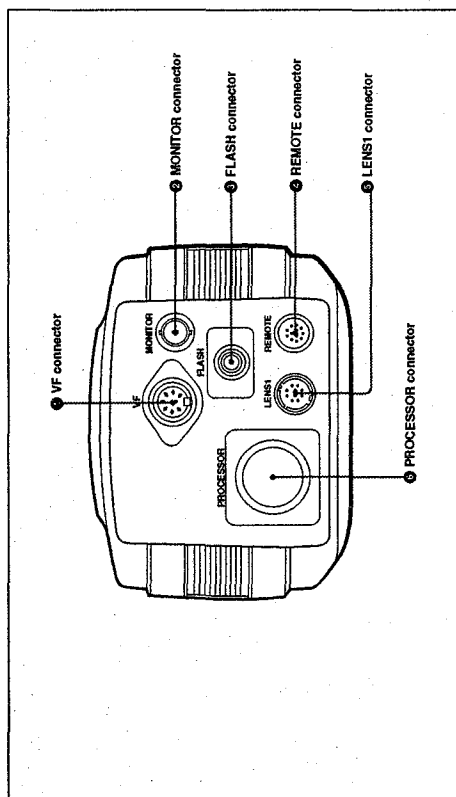
When using a lens other than the special-purpose one (VCL-1205BYS), connect the cable from the lens to this connector.

③ Mounting hole

This accepts the fixing screw when the camera head is mounted on a tripod.

Location and Function of Parts

Rear view



1 VF (viewfinder) connector (DIN 8-pin)
Connect the cable from the viewfinder.

2 MONITOR connector (BNC type)
This outputs a composite video signal. Using a 75-ohm coaxial cable (not supplied), connect this to the composite video input connector (BNC type) of a video monitor.

3 FLASH connector (X-contact socket)
Connect the cable from a flash unit.
This connector is not used when the cable from the flash unit is connected to the FLASH connector on the digital processor.

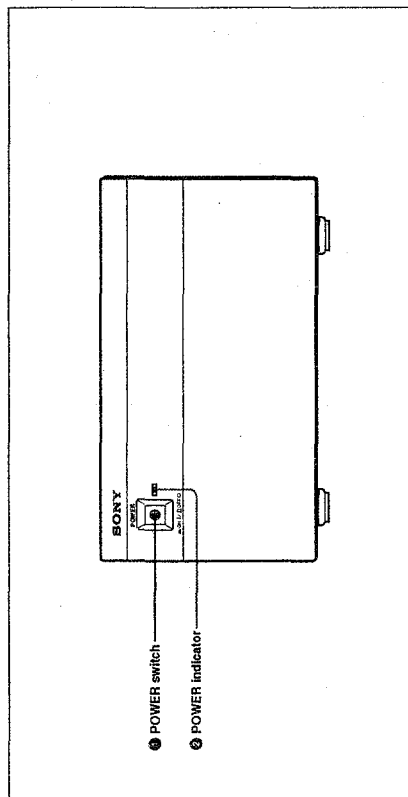
4 REMOTE connector (12-pin, female)
Connect the supplied remote controller.

5 LENS1 connector (20-pin, female)
When using the special-purpose lens (VCL-1205BYS), connect the cable from the lens.

6 PROCESSOR connector (26-pin, male)
Connect this to the CAMERA connector of the digital processor with the supplied camera cable.

Digital Processor

Front panel



1 POWER switch
Press this in to power on the digital processor. Press it once more to power off.

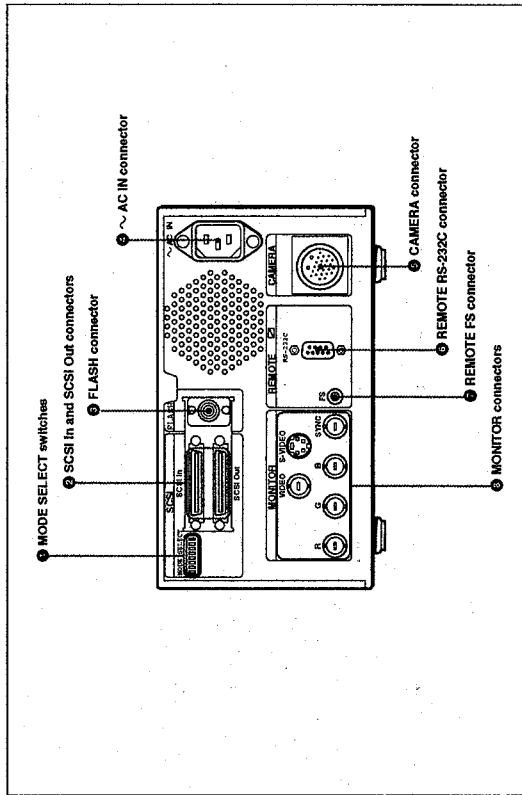
2 POWER indicator
This lights up when the digital processor is powered on.

Note

Once you have powered off the digital processor, do not try to power it on again immediately. Doing this may result in failure anyway.

Location and Function of Parts

Rear panel



1 MODE SELECT switches

These eight DIP switches select the SCSI ID of the digital processor, the attenuation compensation setting for the camera cable, and other settings.

For details of the settings of these switches, see the section "Setting the DIP Switches" on page 46.

2 SCSI In and SCSI Out connectors (50-pin, high-density)
Use these to connect to other SCSI devices (computer, printer, and so forth).

For details of the SCSI connections, see the section "SCSI Connections" on page 44.

3 FLASH connector (X-contact socket)

Connect the cable from a flash unit.
This connector is not used when the cable from the flash unit is connected to the FLASH connector on the camera head.

4 ~ AC IN connector

Use the supplied power cord to connect to a 120 V AC power outlet.

5 CAMERA connector (26-pin, female)

Connect this to the PROCESSOR connector of the camera head with the supplied camera cable.

6 REMOTE RS-232C connector (D-sub 9-pin, female)

(Undefined.)

7 REMOTE FS (foot switch) connector (mini-jack)

Connect the cable from a foot switch.

8 MONITOR connectors

8 MONITOR connectors

These connectors output signals for input to a video monitor.

VIDEO output connector (BNC type): Using a 75-ohm coaxial cable (not supplied), connect this to the composite video input connector (BNC type) of the monitor.

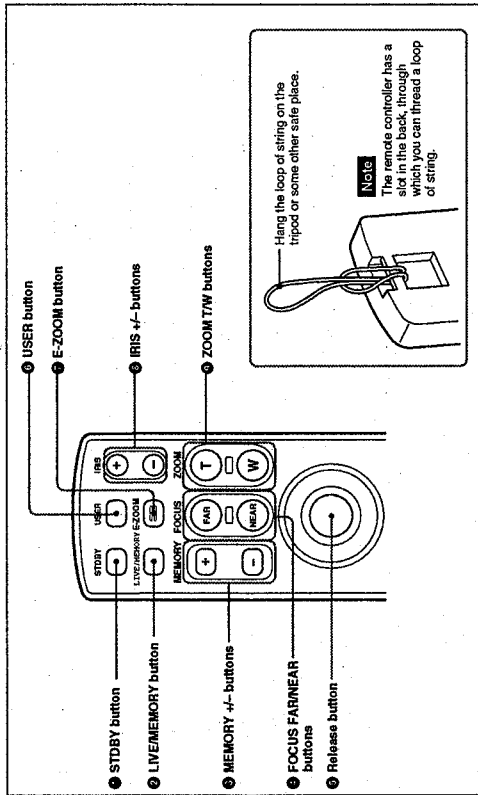
S-VIDEO output connector (Mini-DIN, 4-pin): Using an S-video cable (not supplied), connect this to the S-video input connector of the monitor.

R, G, B, and SYNC output connectors (BNC type): Using 75-ohm coaxial cables (not supplied), connect these to the RGB and sync input connectors of the monitor.

Location and Function of Parts

Remote Controller

Upper section



① STBY (standby) button

When using a lens other than the special-purpose lens (VCL-1205BS), pressing this button puts the camera into the standby mode, and stops down the iris to the current setting.

② LIVE/MEMORY button

Pressing this button toggles between the live and memory monitor modes.

Live mode: The image from the camera lens is output to the monitor. At this point the lens iris is automatically in the fully-open position.

Memory mode: The image saved in the currently selected memory is output to the monitor.

③ MEMORY +/- buttons

In the memory monitor mode, these buttons select the memory.

MEMORY +: Pressing this button switches from the currently selected memory to the next higher numbered memory (1 → 2 → 3 ...).

MEMORY -: Pressing this button switches from the currently selected memory to the next lower numbered memory (9 → 8 → 7 ...).

④ FOCUS FAR/NEAR buttons

These adjust the focus.

FOCUS FAR: Pressing this button focuses further away.

FOCUS NEAR: Pressing this button focuses closer to the camera.

⑤ Release button

Press this button to take a picture.

Using the special-purpose lens (VCL-1205BS):

Pressing this button instantaneously stops down the iris to the current setting, and captures the image to memory.

Using other lenses: If the camera is in standby mode, pressing this button instantaneously captures the image to memory. If not in standby mode, the iris is first stopped down to the current setting (which takes several seconds), and then the image is captured to memory.

⑥ USER button

When using the Control Software, press this button to recall user files (USER1, USER2, and USER3). Recalling one of these files automatically sets up the system according to the settings in the file. You can also use this button to switch from one user file to another.

For details of the Control Software, see Chapter 5.

⑦ E-ZOOM (electronic zoom) button

Pressing this button zooms in at a 2:1 ratio on the center of the live image (E-ZOOM mode). Use this button to focus quickly. Pressing the button once more exits the E-ZOOM mode, and returns to the normal image.

Note

In the E-ZOOM mode, only the FOCUS FAR/NEAR and ZOOM T/W buttons operate.

⑧ IRIS +/- buttons

These adjust the lens iris.

IRIS +: Pressing this button increases the numerical value of f-stop (i.e. stop down the iris).

IRIS -: Pressing this button decreases the numerical value of f-stop (i.e. open up the iris).

⑨ ZOOM T/W (telephoto/wide angle) buttons

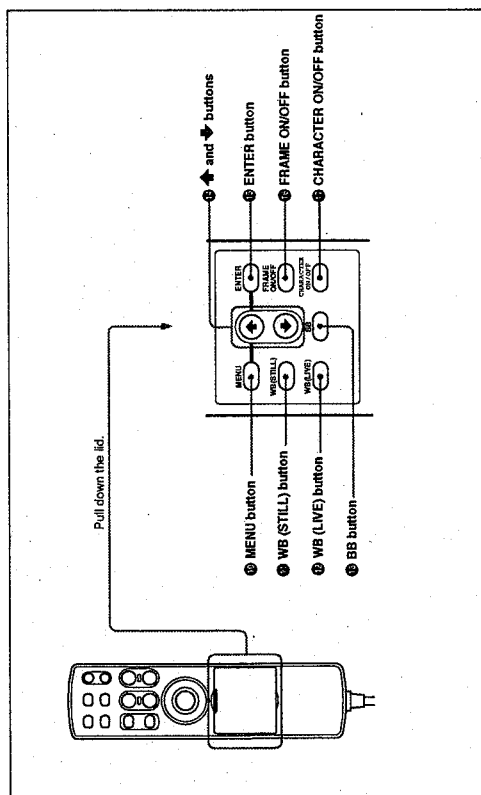
These control the zoom.

ZOOM T: Pressing this button zooms in.

ZOOM W: Pressing this button zooms out.

Location and Function of Parts

Lower section



1 MENU button

Press this button to access the menus. Press and release quickly to display the main menu on the monitor screen. Press once more to clear the menu from the monitor screen. Hold down the button for at least two seconds to display the live menu.

For details of the menus, see Chapter 4.

2 WB (white balance) (STILL) button

Hold this button down for at least two seconds to adjust the white balance for the still image captured to memory. This carries out the white balance adjustment automatically, with the lens iris stopped down to the current setting.

For details of the procedure for white balance adjustment, see page 27.

2 WB (white balance) (LIVE) button

Hold this button down for at least two seconds to adjust the white balance for the live image output. This carries out the white balance adjustment automatically, with the lens iris in the fully open position.

For details of the procedure for white balance adjustment, see page 27.

3 BB (black balance) button

Hold this button down for at least two seconds to adjust the black balance.

For details of the procedure for black balance adjustment, see page 26.

4 and 5 buttons

Press these buttons to move the cursor on the menu screen up and down. Also use them to adjust setting values of certain menu items.

For details of the menus, see Chapter 4.

6 ENTER button

Press this button to go down to the next level of the menus, and also to confirm settings made within the menus.

For details of the menus, see Chapter 4.

7 FRAME ON/OFF button

When using the supplied control software, press this button to toggle on and off the display on the monitor screen of a frame showing the effective print area, horizontal and vertical coordinate axes, and a background image. The factory default setting is for this display function to be disabled.

For details of the control software, see Chapter 5.

8 CHARACTER ON/OFF button

Press this button to toggle the status display on the monitor screen between the on and off settings. The factory default setting is for the status display to be enabled.

The status display indicates the live or memory monitor mode, the iris setting, and the memory selection and availability.

Powering On and Off

Powering On

Use the following procedure to power on.

Note

When using the system for the first time, before powering on be sure to set the DIP switches appropriately.

For details of the settings of the DIP switches, see page 46.

- 1 Power on the monitor, printer, and other peripheral devices.

For details, refer to the user documentation provided with the peripheral devices.

- 2 Power on the digital processor (press in the POWER switch on the front panel).

If the "BEEP" item in the OTHERS menu is set to "ON" (the factory default setting), then the digital processor emits a double beep about five seconds after it is powered on, indicating that it is ready for operation.

For details of the menus, see Chapter 4.

When the digital processor is ready for operation, the system automatically switches to the live monitor mode, and the mode indication "LIVE" is displayed on the monitor screen.

For details of the live monitor mode, see the section "Live and Memory Monitor Modes" on the next page.

For details of the operating mode indication, see the section "Status Indications" on page 23.

- 3 If you are using a computer, power on the computer.

For details, refer to the user documentation provided with the computer.

Note

If you power on the computer before the digital processor is ready for operation (after the double beep), the computer may not start up correctly.

Powering On and Off

Powering Off

Use the following procedure to power off:

- 1** If you are using a computer, power off the computer.
For details, refer to the user documentation provided with the computer.
- 2** Power off the digital processor (press the POWER switch on the front panel).
- 3** Power off the monitor, printer, and other peripheral devices.

Live and Memory Monitor Modes

Pressing the LIVE/MEMORY button on the remote controller toggles between the live and memory monitor modes.

- In the live monitor mode, the image from the camera is output to the monitor. At this point the lens iris is automatically in the fully-open position, regardless of the current setting, and "LIVE" appears in the status indication on the monitor in the position indicating the mode.
- In the memory monitor mode, the image saved in the memory currently selected with the MEMORY +/- buttons is output to the monitor. "MEMORY" appears in the status indication on the monitor in the position indicating the mode, together with the selection and availability of the memories (1 to 9).

For details of the memory status indication, see the next section.

Status Indications

Pressing the CHARACTER ON/OFF button on the remote controller toggles the status display on the monitor screen between the on and off settings.

- When the status display is in the "on" mode, it indicates the live or memory monitor mode, the iris setting, and the memory status (selection and availability of each memory).
- Even when the status display is in the "off" mode, the status display appears, but disappears again after a few seconds.

The following illustration shows the positions of the various status indication items.

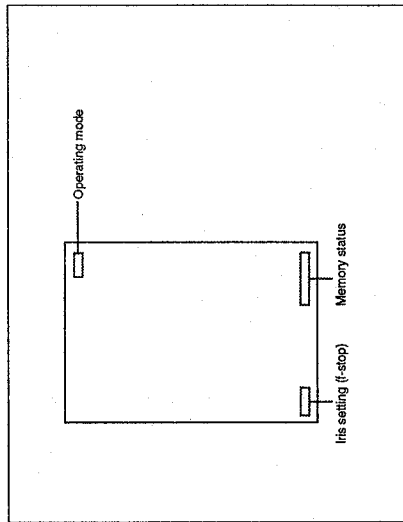
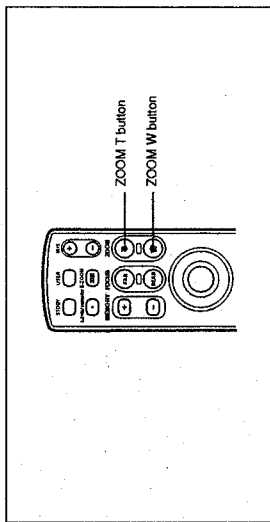


Image Adjustments and Focusing

Adjusting the Zoom



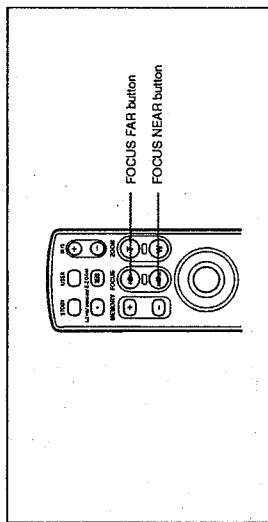
To zoom in
Press the ZOOM T (telephoto) button on the remote controller.

To zoom out
Press the ZOOM W (wide angle) button on the remote controller.

To adjust the zoom angle manually
Set the lens to manual zoom mode, and turn the zoom ring.

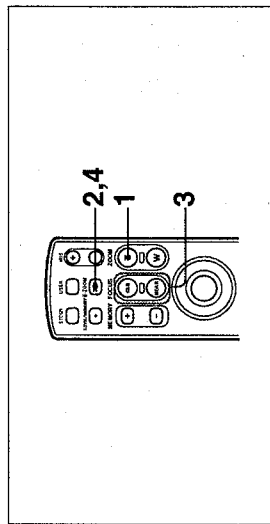
Focusing

Focusing without changing the zoom angle



- To focus further away, press the FOCUS FAR button on the remote controller.
- To focus closer, press the FOCUS NEAR button on the remote controller.
- To focus manually, set the lens to manual focusing mode, and turn the focusing ring.

For most accurate focusing
Using the E-ZOOM function, you can focus more accurately.



1 Press the ZOOM T button on the remote controller, to select the narrowest telephoto angle.

2 Press the E-ZOOM button.

This switches to the E-ZOOM mode, and zooms in at a 2:1 ratio on the center of the image.

3 Press the FOCUS FAR button or FOCUS NEAR button to adjust the focus.

4 Press the E-ZOOM button.

This exits the E-ZOOM mode, and returns to the normal image.

Note

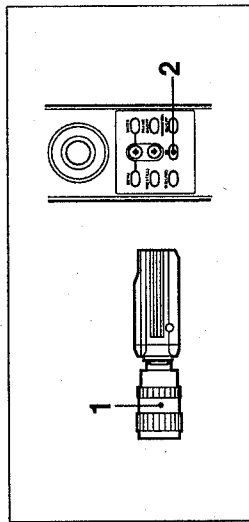
Until you exit from the E-ZOOM mode, only the FOCUS FAR/NEAR and ZOOM TW buttons operate.

Adjusting the Black Balance

To obtain images with a natural color balance, carry out black balance adjustment in the following cases. The adjustment setting is preserved for about ten years, even when the unit is powered off.

- When using the camera for the first time
- When you have replaced the camera
- When the camera has not been used for a long interval
- When the ambient temperature has changed greatly
- At the change of the seasons

Use the following procedure to carry out black balance adjustment.



- 1 Check that the lens is in automatic iris mode.

Note

If you are using a lens with no automatic iris function, close the iris completely.

- 2 Hold down the BB button on the remote controller for at least two seconds.

This automatically closes the lens iris completely, and carries out black balance adjustment. The message "Reading Color Table..." appears on the monitor screen.

The image on the monitor screen may flicker while the adjustment is in progress, but this is not a fault.

When the adjustment is completed, the message "BB:OK" appears.

If the adjustment was not achieved

The message "BB:NG Please try again" appears. Repeat the above procedure.

Adjusting the White Balance

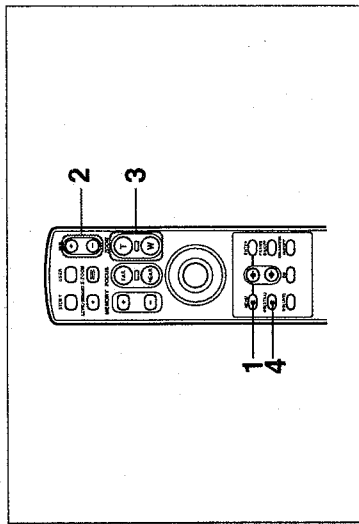
To obtain images with a natural color balance, carry out white balance adjustment in the following cases. The adjustment setting is preserved for about ten years, even when the unit is powered off.

- When using the camera for the first time
- When the lighting conditions change

This system keeps separate white balance settings for the still images captured to memory and the live image output to the monitor.

Adjusting the white balance for still images

After setting up the lighting, use the following procedure.



- 1 Press the MENU button on the remote controller to access the main menu, and make the following settings.
 - Select the PICTURE menu, and set "C-TEMP" to "AWB" (this is the factory default setting).
 - Select the FLASH menu, and if using a flash, set the "FLASH" item to "ON" (this is the factory default setting). Next select the flash interval with the "INTERVAL" item. If not using a flash, set the "FLASH" item to "OFF."

For details of menu operations, see Chapter 4.

- 2 Press the IRIS +/- buttons to adjust the iris.

For details of the adjustment, see page 30.

(Continued)

Adjusting the White Balance

- 3** Under the same lighting conditions as for shooting, position a white subject (white pattern, white cloth, etc.), and zoom in so that it fills the screen.

- 4** Hold down the WB (STILL) button on the remote controller for at least two seconds.

This automatically starts white balance adjustment. The message "Reading Color Table..." appears on the monitor screen.

If the FLASH menu setting is "FLASH ON", the flash flashes several times.

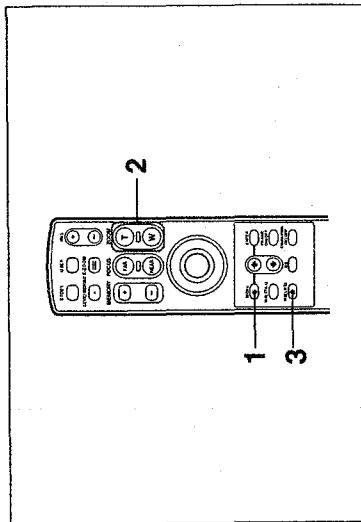
When the adjustment is completed, the message "WB:OK" appears.

If the adjustment was not achieved

The message "WB:NG Please try again" appears. Repeat the above procedure.

Adjusting the white balance for live images

After setting up the lighting, in live monitor mode use the following procedure.



- 1** Hold down the MENU button on the remote controller for at least two seconds to access the live menu, and set "C-TEMP" to "AWB".

For details of menu operations, see Chapter 4.

- 2** Under the same lighting conditions as for shooting, position a white subject (white pattern, white cloth, etc.), and zoom in so that it fills the screen.

- 3** Hold down the WB (LIVE) button on the remote controller for at least two seconds.

This automatically starts white balance adjustment. The message "Reading Color Table..." appears on the monitor screen.

When the adjustment is completed, the message "WB:OK" appears.

If the adjustment was not achieved

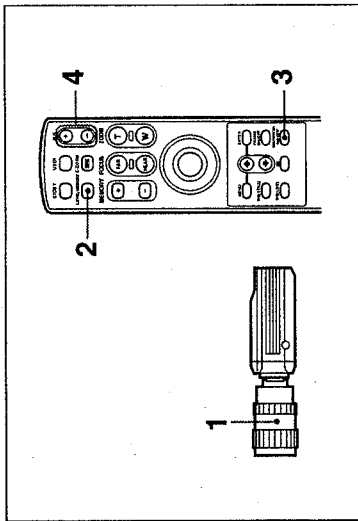
The message "WB:NG Please try again" appears. Repeat the above procedure.

Adjusting the Iris

Use the following procedure to adjust the iris setting (f-stop) at the instant that a still image is captured to memory.

Note

For normal purposes select F5.60 (factory default setting).



- 1 Set the lens to the automatic iris mode.
- 2 If in the memory monitor mode, press the LIVE/MEMORY button to switch to the live mode.
- 3 If the status display mode is off, press the CHARACTER ON/OFF button to switch on the status display.

The "LIVE" mode indication appears on the monitor screen.

The f-stop setting appears on the monitor screen.

- 4 • To increase the numerical value of the f-stop (i.e. to stop down the iris for still image capture), press the IRIS + button.
- To decrease the numerical value of the f-stop (i.e. to open up the iris for still image capture), press the IRIS - button.

Note

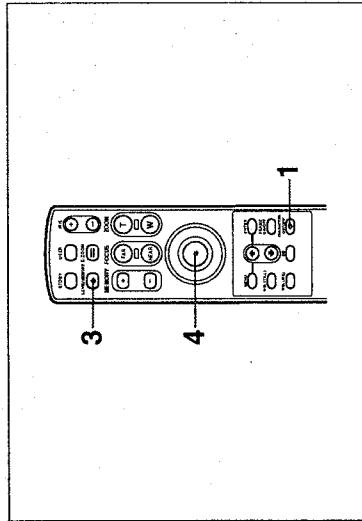
Changing this setting does not affect the iris during output of live images. The f-stop setting only takes effect when the release button is next pressed.

Shooting

This section describes the procedures for selecting image memories and for shooting (capturing an image into the selected memory).

Basic Procedure

The following is the basic procedure for shooting.



- 1 If the status display mode is off, press the CHARACTER ON/OFF button to switch on the status display, and check the memory status indication (selection and availability).

- 2 Select the memory into which you wish to capture an image.

For details, see the section "Selecting a Memory" on page 33.

Note

If you select a memory which already holds an image, carrying out step 4 will overwrite this existing image in the memory.

- 3 If in the memory monitor mode, press the LIVE/MEMORY button to switch to the live monitor mode.

The "LIVE" mode indication appears on the monitor screen.

(Continued)

Shooting

4 Press the release button.

This instantaneously stops the lens down to the iris setting, and captures an image to the selected memory.

Note

When using a lens other than the special-purpose lens (VCL-120SBYS), press the STDBY button first, to switch to the standby mode, then press the release button.

When you switch to standby mode, after about 3 seconds the iris is stopped down to the current setting, and the "STAND-BY" mode indication appears on the monitor screen.

- When the memory selection mode is "increment on," first the system switches to review mode, and the image captured to memory appears on the monitor for a few seconds.

Next the system switches back to live monitor mode. During the review, the "REVIEW" mode indication appears on the monitor screen.

- When the memory selection mode is "increment off," the system switches to memory monitor mode, and the image captured to memory is displayed on the monitor screen.

For details of the memory selection mode, see the section "Selecting a Memory" on the next page.

5 To continue shooting, repeat steps 2 to 4.

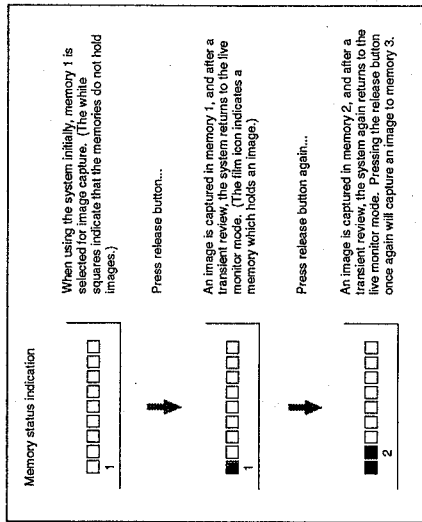
Selecting a Memory

There are two modes in which you can select a memory: "increment on" mode, and "increment off" mode.

"Increment on" mode

In "increment on" mode, each time you press the release button to capture an image in memory, the memory selection for the next image is incremented automatically (1, 2, 3, ... 9).

The following shows how the memory selection changes in "increment on" mode.



To select the "increment on" mode

From the main menu, select the CAMERA menu, then set the "INCREMENT" item to "ON" (this is the factory default setting).

For details of menu operations, see Chapter 4.

“Loop on” mode and “loop off” mode

In “increment on” mode, there are two ways of operating: either the “loop on” mode or the “loop off” mode.

“Loop on” mode: After an image is captured to memory 9, memory 1 is automatically selected for the next image.

Note

If there is already an image stored in memory 1 (i.e. the status indication shows a film icon for memory 1), when you press the release button this captures a new image to memory 1, and the previously stored image is lost.

“Loop off” mode: After an image is captured to memory 9, there is no automatic memory selection, and after the review, the system returns to the live monitor mode with a message “MEMORY FULL” display.

To switch between “loop on” mode and “loop off” mode

From the main menu, select the CAMERA menu, then set the “LOOP” item to “ON” (this is the factory default setting) or “OFF.”

“Increment off” mode

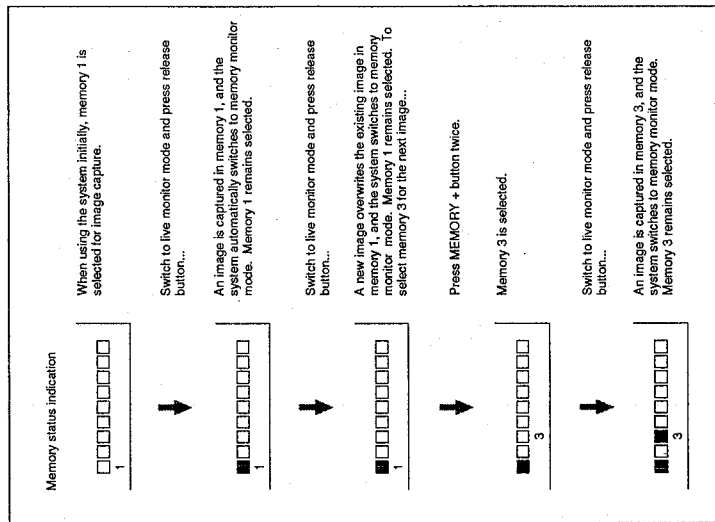
In “increment off” mode, when you press the release button there is no automatic memory selection. To select the memory, enter memory monitor mode, then press the MEMORY +/- buttons.

To select memory numbers in ascending order press the MEMORY + button, and to select memory numbers in descending order press the MEMORY - button.

Note

The MEMORY +/- buttons do not operate in the live monitor mode. First press the LIVE/MEMORY button to switch to memory monitor mode.

The following shows an example of operation in “increment off” mode.



Shooting

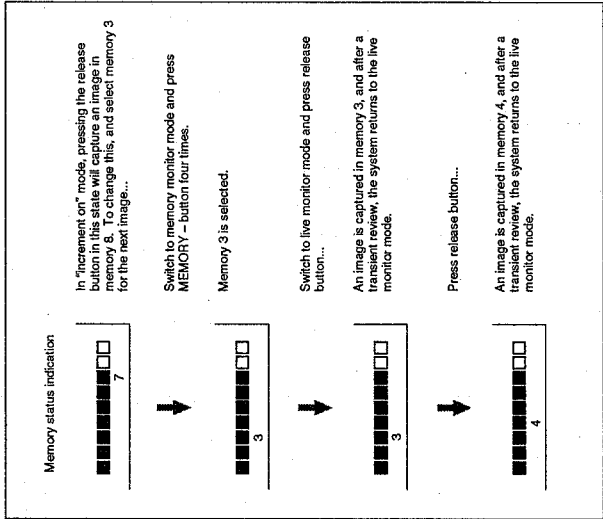
To select the "Increment off" mode

From the main menu, select the CAMERA menu, then set the "INCREMENT" item to "OFF."

For details of menu operations, see Chapter 4.


Manually selecting a memory while in "Increment on" mode

Even in "Increment on" mode, you can use the MEMORY +/- buttons to select a memory.
The following shows an example of such operation.



Preventing overwriting of memory

By control from the computer, you can lock any particular memory so that it cannot be overwritten.

When a memory is locked in this way (status indication ) the memory selection basically proceeds in the same way as before, except that any locked memories are skipped. In other words, if only memory 4 is locked, an image which would have been captured in memory 4 is in fact captured in memory 5.

Shooting

Reviewing a Captured Image

In "Increment on" mode

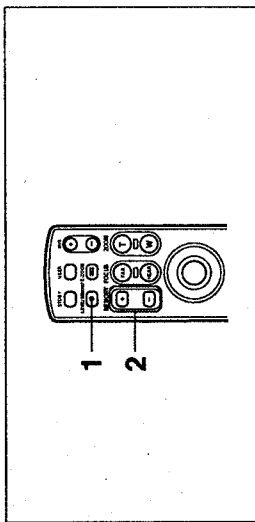
When the memory selection mode is set to "increment on," pressing the release button causes the system to automatically switch to review mode, and display the captured image on the monitor screen for several seconds. Thereafter it automatically returns to the live monitor mode. Thus you can continue to capture images while quickly checking each one.

In "Increment off" mode

In this mode, pressing the release button causes the system to switch to the memory monitor mode, and display the captured image on the monitor screen. The same image remains displayed until you select the live monitor mode again.

Selecting memory monitor mode to check images

Whether in the "increment on" or "increment off" mode, you can check the contents of any particular memory by using the following procedure.



- 1** If not in memory monitor mode, press the LIVE/MEMORY button to switch to the memory monitor mode.

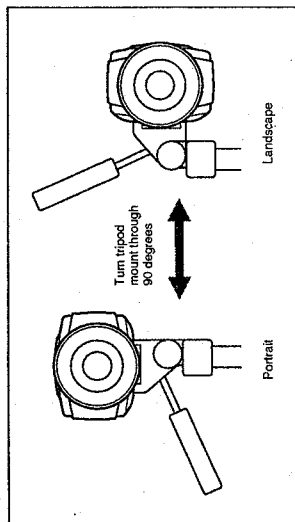
This displays the image held in the currently selected memory on the monitor.

- 2** Press the MEMORY +/- buttons to select other memories to check.

This displays the image held in each selected memory on the monitor.

Switching Between Landscape and Portrait Orientations

You can turn the tripod mount through 90 degrees to alter the camera orientation, for either portrait or landscape images.



Menu and status indications

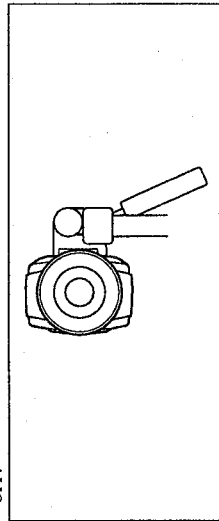
When the camera head is in the landscape orientation, the display of menus and status information on the monitor screen is also turned through 90 degrees.

To make these displays horizontal as in the portrait mode, from the main menu select the CAMERA menu, and set the "ROTATE" item to "OFF."

For details of menu operations, see Chapter 4.

Notes

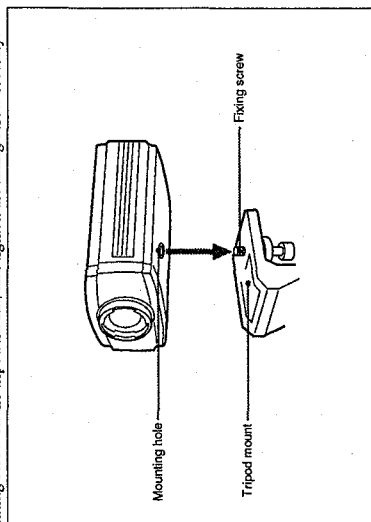
- It is recommended to use a portrait monitor when shooting in portrait format and a landscape monitor when shooting in landscape format. Physically rotating a monitor through 90 degrees may damage it or cause it to fail.
- When using the camera head in the orientation shown below, select the CAMERA menu from the main menu and set the "ROTATE" item to "OFF."



Installing the Camera Head

Mounting the Camera Head on a Tripod

Align the threaded mounting hole on the bottom of the camera with the fixing screw on the tripod mount, and tighten the fixing screw securely.

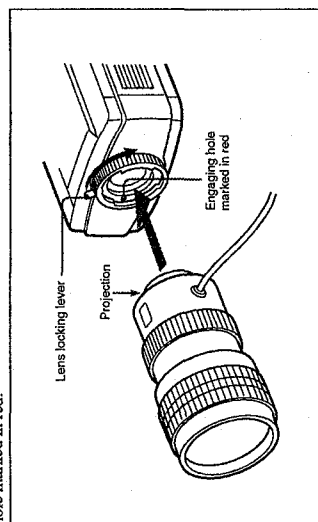


Note

The tripod must be designed to support a load of at least 5 kg.

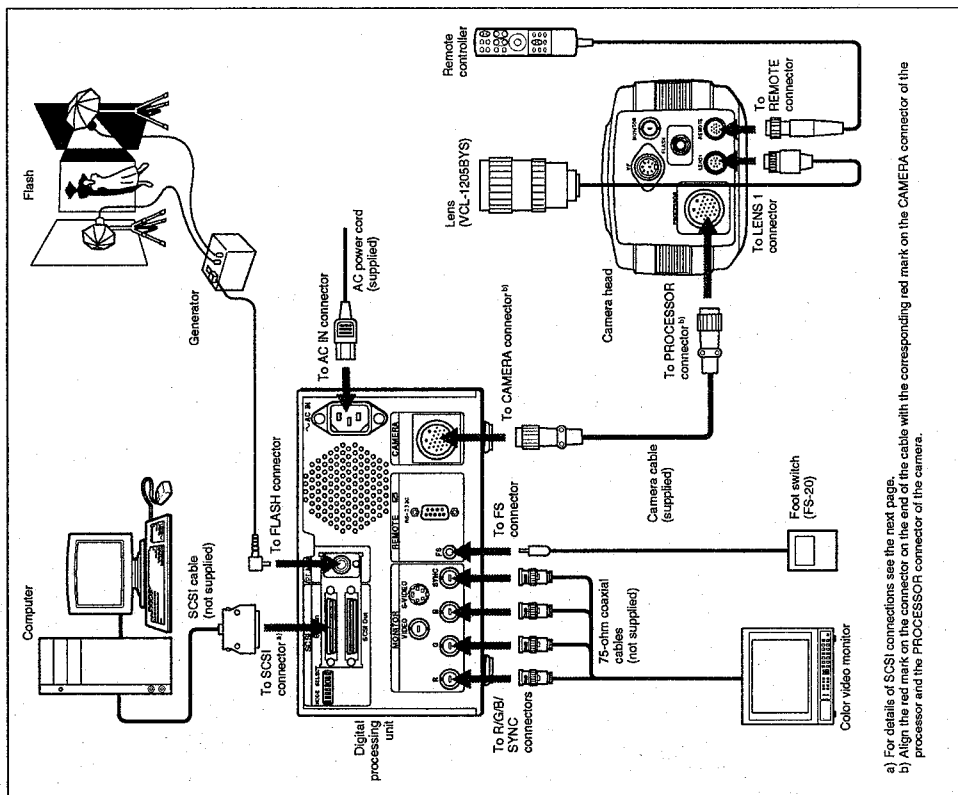
Mounting the Lens

Insert the lens into the camera lens mount, then press down the lens locking lever in a clockwise direction. Make sure that the lens is inserted with the projection on the mounting end in alignment with the engaging hole marked in red.



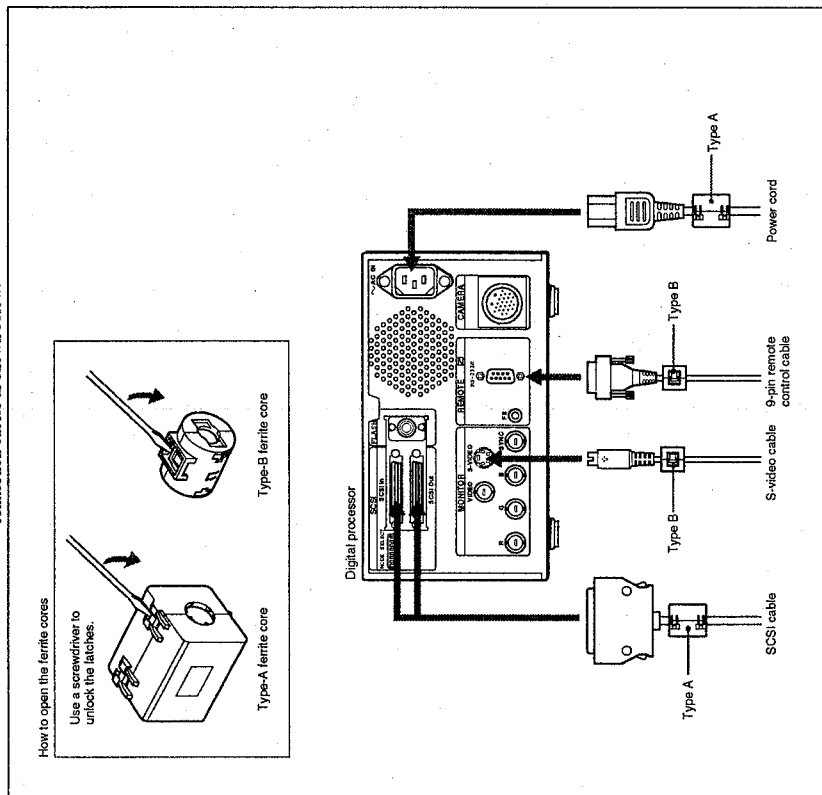
Connections

The connections required depend on the system components being used. See the section "Principal Examples of Use" on page 9 to determine the required devices.



Attaching Ferrite Cores to Cables

To protect the digital processor against noise which may affect its operation, attach supplied ferrite cores (noise filters) to some of the connection cables as shown below.



SCSI Connections

This section describes the SCSI connections between the DKC-ST5 and a computer and any other SCSI devices.

Power off the DKC-ST5 and all of the other connected devices before making the SCSI connections.

SCSI Cables

It is recommended to use high-impedance cables complying with the SCSI standard for the connections.

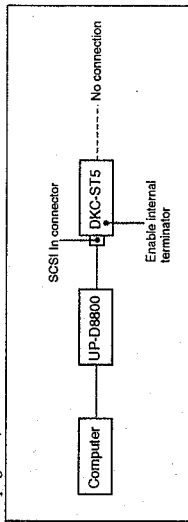
Note

Up to seven SCSI devices can be connected in a daisy-chain to the SCSI port of the computer, but the total length of the SCSI cables should not exceed 6 meters.

SCSI Terminators

Using the DKC-ST5 Internal terminator

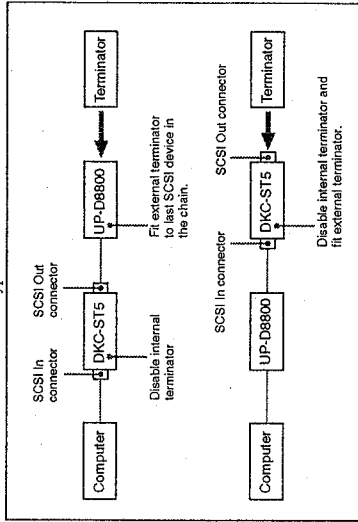
The DKC-ST5 has a built-in active SCSI terminator. If you do not have an external terminator, then as shown in the following illustration, connect the DKC-ST5 as the last device in the chain, and enable the internal terminator. (Set DIP switch 4 on the digital processor to the ON position; see page 46.)



Not using the DKC-ST5 internal terminator

In this case, carry out the two following items:

- Disable the DKC-ST5 internal terminator. (Set DIP switch 4 on the digital processor to the OFF position; see the next page.)
- Fit an external terminator to the last SCSI device in the chain. It is recommended to use an active type of external terminator.



Note

The maximum number of terminators which can be used in a SCSI chain is three.

SCSI ID

When you connect a number of SCSI devices in a daisy-chain, it is important to assign SCSI IDs (0 to 7) to the devices in such a way that they do not conflict.

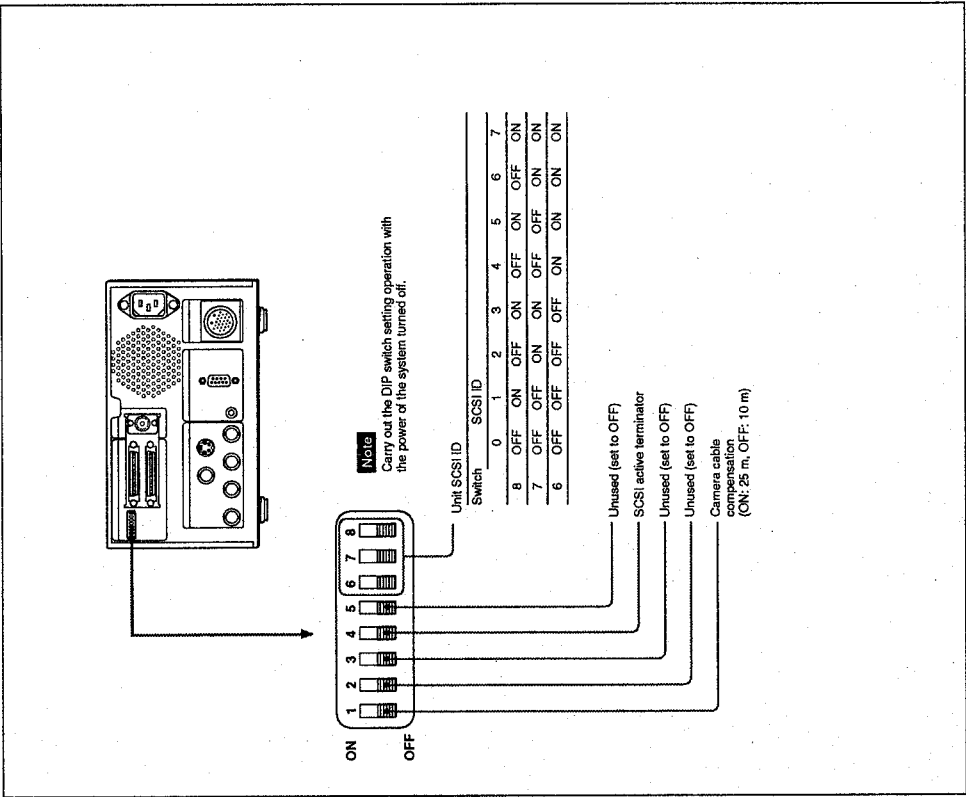
To set the SCSI ID of the DKC-ST5, use DIP switches 6 to 8 on the digital processor.

For details of the settings of the DIP switches, see the next page.

Note that the allocation of IDs is not related to the physical sequence of the devices in the chain.

Setting the DIP Switches

There are eight DIP switches on the rear panel of the digital processor. When using the system for the first time, before powering on set these switches appropriately. The following shows the function of each of the DIP switches.



Overview

You use the menus to make various camera settings such as the color temperature conversion characteristics, the electronic shutter speed, and so forth. There are two principal menus, the main menu, and the live menu.

Main menu

All settings affecting still images (i.e. those captured into memory) are in the main menu, which consists of a number of submenus.

For details of the settings in the main menu, see page 51.

To access the main menu
Press the MENU button.

Live menu

The live menu contains only color balance settings for live images (i.e. the camera output in live monitor mode).

For details of the settings in the live menu, see page 54.

To access the live menu
Hold down the MENU button for at least two seconds.

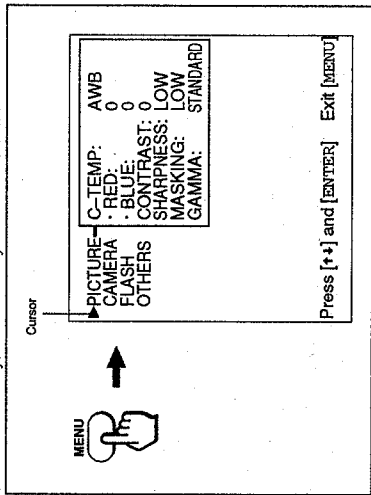
Basic Menu Operation Procedure

This section illustrates the basic menu operation procedure, taking as an example the method of setting the ISO exposure index (the "film speed"). Note that the procedure for accessing the live menu is exactly the same, except that you must hold down the MENU button for at least three seconds.

Use the following procedure to set the ISO exposure index.

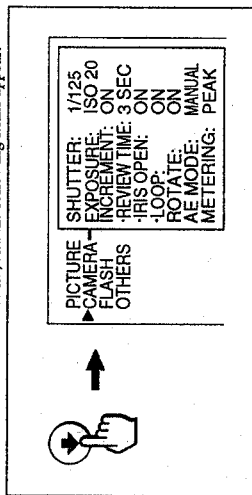
- 1 Press the MENU button.

The main menu appears on the monitor screen. When you access the main menu initially, the cursor is by the PICTURE item.



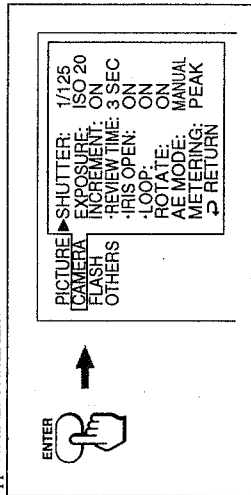
- 2 Press the \blacktriangledown button to align the cursor with "CAMERA."

This selects the CAMERA menu, and the following items appear.

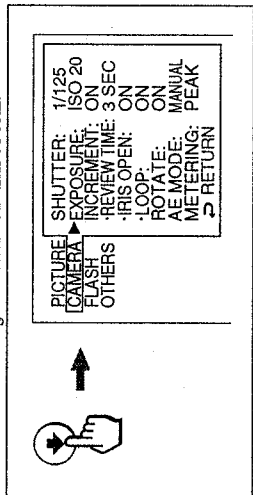


- 3 Press the ENTER button.

The cursor enters the CAMERA menu, and the extra "RETURN" item appears in the bottom line.

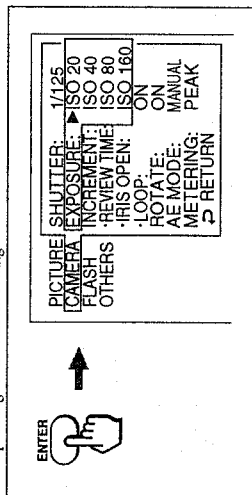


- 4 Press the \blacktriangledown button to align the cursor with "EXPOSURE."



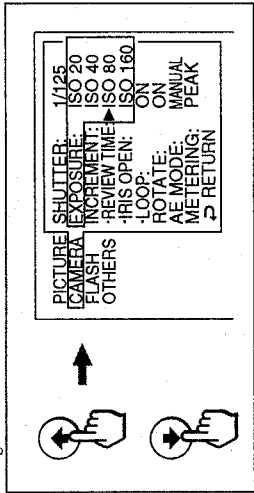
- 5 Press the ENTER button.

This displays the setting list for the "EXPOSURE" item, with the cursor pointing to the current setting.



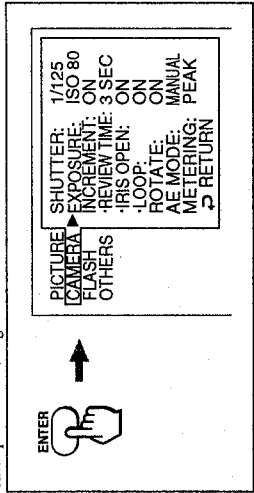
(Continued)

6 Press the and buttons to move the cursor to the desired new setting.

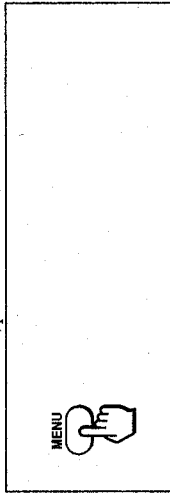


7 Press the ENTER button.

This updates the setting for "EXPOSURE."



8 To exit from the menus, press the MENU button.



The main menu disappears from the monitor screen.

Menu Settings

Main Menu

The main menu consists of the following submenus:

- PICTURE menu
- CAMERA menu
- FLASH menu
- OTHERS menu


The following tables list the settings in each submenu.

PICTURE menu

Menu Item	Settings
C-TEMP Set the color temperature conversion characteristics of the camera to match the light source being used. Factory default setting: AWB	AWB: Automatically select the color balance setting taken for still images. 5600K: Use this setting for daylight or fluorescent lighting. 3200K: Use this setting for tungsten lighting. Factory default setting: AWB
-RED Adjust the red gain. (After a white balance adjustment, it is not normally necessary to set this item.) Factory default setting: 0	-127 to +127
-BLUE Adjust the blue gain. (After a white balance adjustment, it is not normally necessary to set this item.) Factory default setting: 0	-127 to +127
CONTRAST Adjust the contrast. Factory default setting: 0	-5 to +5
SHARPNESS Adjust the degree of outline emphasis (low, middle, or high) Factory default setting: LOW	OFF: No outline emphasis LOW, MIDDLE, HIGH
MASKING Adjust the degree of increasing the color saturation (low, medium, and high). Factory default setting: LOW	OFF: No increase in the color saturation. LOW, MIDDLE, HIGH
GAMMA Adjust the gamma correction setting. Factory default setting: STANDARD	STANDARD: Use the standard setting. PRESET1, PRESET2, PRESET3: Use the respective PRESET1, PRESET2, and PRESET3 settings.

Menu Settings

CAMERA menu

Menu Item	Settings
SHUTTER Set the camera shutter speed (in seconds)	4, 2, 1, 1/2, 1/25, 1/50, 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000 Factory default setting: 1/125
EXPOSURE Set the ISO exposure index for the camera	ISO 20, 40, 80, 160 Factory default setting: ISO 20
INCREMENT Select whether the memory selection is incremented automatically or not. For details of the method of memory selection, see page 33.	ON: The memory selection is incremented automatically. When this setting is selected, the menu items "REVIEW TIME", "IRIS OPEN" and "LOOP" appear. OFF: The memory selection is not incremented automatically. Factory default setting: ON
REVIEW TIME When the above "INCREMENT" item is set to "ON," adjust the review time, during which an image captured to memory is displayed after the release button is pressed.	0 sec, 1 sec, 3 sec, 5 sec, 10 sec Factory default setting: 3 sec
IRIS OPEN When the above "INCREMENT" item is set to "ON," select whether after the release button is pressed to return to the live monitor mode, or not (i.e. to return the lens iris to the fully open position)	ON: Return to the live monitor mode. Use this setting when you wish to check each new image on the monitor screen. OFF: Do not return to the live monitor mode (keep the iris setting unchanged). Use this setting when the timing of image capture is important. Factory default setting: ON
LOOP When the above "INCREMENT" item is set to "ON," select whether or not to use the memory loop mode. For details, see page 34.	ON: Select the memory loop mode. After capturing an image to memory 9, memory 1 is automatically selected for the next image. OFF: Do not select the memory loop mode. After capturing an image to memory 9, the message "MEMORY FULL" appears. Factory default setting: ON
ROTATE Select whether or not to rotate the menu and status displays on the monitor screen through 90 degrees.	ON: Rotate the displays through 90 degrees. Use this setting to make it easier to check the displays in portrait format. OFF: Do not rotate the displays through 90 degrees. Use this setting to make it easier to check the displays in landscape format. Factory default setting: ON
AE MODE Select the manual or automatic exposure mode.	MANUAL: Manual adjustment APERTURE: Aperture priority automatic exposure SHUTTER: Shutter priority automatic exposure PROGRAM: Program automatic exposure Factory default setting: MANUAL
METERING Select the exposure metering method in the live monitor mode.	PEAK: Adjust exposure to the maximum intensity "cell of image" as defined by dividing the whole image into nine cells having the same area. (The illustration below shows a case in which the maximum intensity cell is the central cell.) With this setting the surroundings of highlights may become dark.  AVG: Adjust exposure to the average intensity of the image. With this setting there may be "burn-out" in the highlights. Factory default setting: PEAK

FLASH menu

Menu Item	Settings
FLASH Select whether or not to use the flash.	ON: Use the flash. When this setting is selected, the menu items "INTERVAL", "CUTOFF SW", and "CALIBRATION" appear. OFF: Do not use the flash. Factory default setting: ON
INTERVAL When the above "FLASH" item is set to "ON," select the flash operation interval.	1 sec, 3 sec, 5 sec, 10 sec Factory default setting: 3 sec Note If the setting is less than the charge time for the flash used, correct automatic control will not be possible.
CUTOFF SW When the above "FLASH" item is set to "ON," select whether or not to carry out mechanical control of the X-contacts on the FLASH connector of the digital processor.	ON: Carry out mechanical control. OFF: Do not carry out mechanical control. Factory default setting: OFF Note Even when set to "ON," there is no mechanical control of the X-contacts on the camera.
CALIBRATION When the above "FLASH" item is set to "ON," measure the synchronized timing of the flash and the electronic shutter.	START: Carry out the measurement. CANCEL: Do not carry out the measurement.

OTHERS menu

Menu Item	Settings
BEEP Select whether or not to beep for confirming an operation.	ON: Beep. OFF: Do not beep. Factory default setting: ON
RESET Reset all of the user menu settings to their factory defaults.	START: Carry out the reset. CANCEL: Do not carry out the reset.

Menu Settings

Live Menu

The live menu consists of the following settings.

Menu Item	Settings
C-TEMP Set the color temperature conversion characteristics of the camera to match the light source being used.	AWB: Automatically select the color balance setting taken for live images. 5600K: Use this setting for daylight or fluorescent lighting. 3200K: Use this setting for tungsten lighting. Factory default setting: AWB
+RED Adjust the red gain. (After a white balance adjustment, it is not normally necessary to set this item.)	-127 to +127 Factory default setting: 0
+BLUE Adjust the blue gain. (After a white balance adjustment, it is not normally necessary to set this item.)	-127 to +127 Factory default setting: 0

Overview

The two floppy disks supplied with the DKC-ST5 contain control software which runs under Microsoft Windows 95[®] and is designed for the following purposes:

- Capturing image data from the DKC-ST5 into the computer
- Carrying out settings and basic operations on the DKC-ST5 from the computer

Chapter 5 describes the environment required for running the control software and the procedure for installation, and also some notes on SCSI connections.

Background information

The following explanation assumes the reader is familiar with basic computer terminology, and has read the introductory documentation relating to Microsoft Windows 95 (Microsoft Windows User's Guide and so forth).

Required Hardware

Computer

An IBM PC/AT[®] or compatible computer with the following specification is required:

- CPU: Intel Pentium or PentiumPro[®]
- RAM capacity: at least 32 MB
- Monitor: 24-bit full-color display function
- Free disk space: at least 150 MB

SCSI Host Adapter with Windows 95 Support

One of the following Adaptec host adapters is required:

- SCSI Direction AHA-1522 (for ISA bus)
- The SCSI Master AHA-1540CP (for ISA bus)
- PCI SCSI Master AHA-2940 (for PCI bus)
- SlimSCSI APA-1460 (for PCMCIA slot)

Notes

- The control software may not run correctly using the Microsoft Windows 95 built-in SCSI host adapter device driver and ASP32 manager.
- Be sure to install the device driver and ASP32 manager stored on the miniport driver disk for Microsoft Windows 95 shipped with the host adapter. After installation, in the System folder within the directory for Windows, the following file should be present:
ASP32 manager (wnaspi32.dll)

Also in the \osubsys\ folder beneath this should be the following:
Device driver for the SCSI host adapter
(sparrow.mpd\ahal54x.mpd\aic78xx.mpd)

Check that these files are dated no earlier than November 1, 1995.

- If your host adapter was not shipped with a miniport driver disk for Microsoft Windows 95, install a new driver from Adaptec's EZ-SCSI[®] Pro Version 4.5 for Microsoft Windows 95.

Required Software

The Microsoft Windows 95 operating system is required.

- 1) Microsoft and Windows are registered trademarks of Microsoft Corporation.
- 2) IBM and AT are registered trademarks of International Business Machines Corporation.

- 3) Pentium and PentiumPro are registered trademarks of Intel Corporation.
- 4) ASPi and EZ-SCSI are registered trademarks of Adaptec Inc.

Installing the Control Software

Preparations

Checking the SCSI Host Adapter

Use the following procedure to check that the Adaptec SCSI host adapter is correctly installed.

- 1 Start Microsoft Windows 95.
- 2 Open the Control Panel window, and double-click the System icon.
- 3 Click on the Device Manager tab, and check that the host adapter to be used for the SCSI controller is displayed.

Connecting the DKC-ST5 and computer

Power off the computer, the DKC-ST5, and any other devices in the system, then connect the DKC-ST5 and the computer with the SCSI cable.

For details of the SCSI connection, see pages 42 to 45.

Setting the DKC-ST5 SCSI ID

With all of the devices powered off, set DIP switches 6 to 8 on the rear panel of the digital processor to a SCSI ID which does not conflict with other devices.

For details, see pages 45 and 46.

Note

The DKC-ST5 does not support SCAM (SCSI Configured Automatically). Even when using a host adapter which supports SCAM, you must manually set an ID which does not conflict.

For details, refer to the documentation provided with your SCSI host adapter.

Powering on the system

Following the description on page 21, power on the system.

Installing the Control Software

Use the following procedure to install the control software in the computer.

- 1 Start Microsoft Windows 95.

When starting Microsoft Windows 95 for the first time after connecting the DKC-ST5 and the computer

In this case a dialog box appears, prompting you to install a device driver.

Since the control software is supported by the ASP32 manager, no driver installation is required. In the dialog box, select "Do not install a driver" and click the OK button.

When starting Microsoft Windows 95 for the second and subsequent times, this operation is not required. The dialog box will, however, appear again if you change the SCSI ID of the DKC-ST5.

- 2 Insert floppy disk 1 supplied with the DKC-ST5 into the floppy disk driver.
- 3 Access the floppy disk, and display a file list.
- 4 Double-click SETUP.EXE.

The setup program starts. Thereafter, follow the directions given in dialog boxes.

Using the Control Software

Installing the control software simultaneously installs a readme.doc file. For details of how to use the control software, consult the readme.doc file.

Note

The control software will hang if after starting it you do any of the following on the DKC-ST5:

- Power off the digital processor
 - Disconnect the camera cable from the digital processor or camera head
 - Disconnect the SCSI interface between the DKC-ST5 and the computer
- If the control software hangs, it will be necessary to restart the system.

Uninstalling the Control Software

Use the following procedure to uninstall the control software.

Note

Before beginning this operation, check the following.

- The control software is not running.
- The readme.doc file about the control software is not open.

- 1 Open the Microsoft Windows 95 Control Panel window, and double-click "Add/Remove Programs," then click on "Install/Uninstall."
 - 2 Select "DKC-ST5" from the list of programs, and click the Add/Remove button.
- Thereafter, follow the directions given in dialog boxes.

Error Messages

If the system is unable to operate normally because of a particular combination of operations, an error message may appear on the monitor. The following table lists the error messages, with their meanings and appropriate action to take.

Message	Meaning	Action to take
BB:NG Please try again	Black balance adjustment failed.	Check the conditions, and try again.
COMMANDER IS LOCKED	The remote controller has been locked by the computer.	Unlock the remote controller from the computer.
FLASH CALIBRATION: NG	Flash calibration failed.	Check the conditions, and try again.
MEMORY FULL	The memory for captured images is full.	Delete images no longer required from memory.
MEMORY IS LOCKED	The currently selected memory for captured images is locked (write-protected).	Either unlock this memory, or select a different memory.
Not available during transferring image data	This operation is not possible during image data transfer.	Wait until image data transfer is finished.
Not available except AWB setting as C-Temp	This operation is not possible unless the "C-TEMP" menu item is set to "AWB."	Set the "C-TEMP" menu item to "AWB."
Not available in E-ZOOM mode	This operation is not possible in the electronic zoom mode.	Exit from the electronic zoom mode and retry.
WB:NG Please try again	White balance adjustment failed.	Check the conditions, and try again.

Troubleshooting

If a problem should occur when you are using the system, consult the following troubleshooting chart, and carry out any suggested action. If you are unable to resolve the problem, or if the problem occurs persistently, contact your Sony dealer.

Symptom	Cause / Items to check / action to take
The system does not power on.	Is the power cord connected correctly? (See page 42.)
The buttons of the remote controller do not operate.	Is the remote controller cable connected correctly? (See page 42.)
There is no image on the monitor.	Are the video signal cables (R, G, B) connected correctly? (See page 42.)
The monitor image colors are peculiar.	There may be blurring when photographing a fast-moving subject. This is not a fault.
Captured images are blurred.	Is the attenuation compensation setting for the camera cable set correctly? Set DIP switch 1 according to the length of the cable. (See page 46.)
The picture quality from the camera is poor.	If the image being displayed is from memory, there will be no change. In this case, switch from memory monitor mode to live monitor mode.
Changing the camera settings does not affect the image on the monitor.	When shooting a moving subject, this may occur in the image on the monitor. This is not a fault, and does not affect captured images.
There are a number of horizontal lines on a live image.	Set the FOCUS/ZOOM switch to the POWER position.
When I change the focus and zoom settings, the lens does not respond.	In this system, when an image is displayed on the monitor the color look-up table is optimized to give the best gradation. The image may not therefore necessarily appear identically on a computer screen.
When an image is transferred to a computer and displayed, the color gradation is completely different from that in the monitor image.	Have the gamma settings been changed since the image was captured? For the same reason as in the previous item, if the current gamma settings are different from the gamma settings when the image was captured, it will not be displayed correctly on the monitor.
When a captured image is displayed on the monitor, the color gradation is peculiar.	This is not a fault.
When shooting with the flash on, the image flickers at the instant an image is captured to memory.	This is caused by the electronic shutter reacting to the high frequency variations in intensity which are a characteristic of fluorescent lighting, and is not a fault.
The color temperature of the live image sometimes changes under fluorescent lighting.	When using flash the images shot are not affected; if not using flash, as far as possible shoot under tungsten lighting.
However I change the settings, the dynamic range of an image transferred to the computer does not fill the 0 to 255 range.	Is the 'CONTRAST' setting in the PICTURE menu set to a negative value? (See page 57.)
I have used cropping on images captured to memory to transfer them part by part to the computer. However, it does not seem to be possible to join them back together again correctly.	Because of the details of the image processing algorithm, it is not in general possible to join parts of images back together without subtle problems of pixel mismatch.
The computer does not recognize the digital processor.	<ul style="list-style-type: none"> Is the SCSI cable connected correctly? (See pages 42 to 45.) Is there a SCSI ID conflict? (See pages 45 and 46.) Is the SCSI terminator fitted correctly? (See page 44.)
SCSI operations are unstable.	

Notes on Use

Do not obstruct ventilation openings

To prevent the camera and processor from overheating, do not obstruct ventilation openings, by for example wrapping the camera and processor in a cloth while they are in operation.

Operation and storage locations

- Avoid operation or storage in any of the following places.
 - Location subject to extremes of temperature (operating temperature range 5°C 35°C (41°F to 95°F))
 - Location subject to direct sunlight for long periods, or close to heating appliances (Note that the interior of a car left in summer with the windows closed can exceed 50°C (122°F).)
 - Damp or dusty places
- Location subject to severe vibrations
- Location near equipment generating strong electromagnetic emissions
- Location near transmitting stations generating strong radio waves

Operate the processor in a horizontal position

The processor is designed to be operated in a horizontal position. Do not operate it on its side, or tilted through an excessive angle (exceeding 20°).

Avoid violent impacts

Dropping the camera and processor, or otherwise imparting a violent shock to them, is likely to cause them to malfunction.

Care

If the casing or panel is dirty, wipe it gently with a soft dry cloth. In the event of extreme dirt, use a cloth steeped in a neutral detergent to remove the dirt, then wipe with a dry cloth. Applying alcohol, thinners, insecticides, or other volatile solvents may result in deforming the casing or damaging the finish.

Shipping

Pack the camera and processor their original carton or equivalent packing, and take care not to impart violent shocks in transit.

Specifications

Camera head

Imaging element $\frac{1}{2}$ -inch CCD, with approximately 1,400,000 pixels

Effective image area

1,280 (H) \times 1,024 (V) pixels
Vertical and horizontal

Pixel offset

3 elements

Photography system

$\frac{1}{2}$ -inch 48 bayonet mount

Lens mount

Auto exposure

• Program (live mode, with flash off)

• Shutter priority (with flash off)

• Aperture priority (with flash off)

• Manual

Exposure compensation

-5 to +5

Sensitivity

Live mode

Still mode

White balance

Auto (ISO 20 to 640)

ISO 20, 40, 80, 160

• Auto (with flash on/off)

• Manual (R and B gains: (-127 to +127)

Electronic shutter

Live mode

Still mode

Auto, 1/25, 1/50, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000

4, 2, 1, 1/25, 1/50, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000

Input/output and control connectors

PROCESSOR: 26-pin, analog

RGB (diagonal color offset)

LENS 1: 25-pin

LENS 2: 12-pin

VIDEO OUT: BNC type

REMOTE: 12-pin

VF: 8-pin, DIN

FLASH: X contact (terminal voltage: 400 V or less)

Power requirements

12 V DC

Current consumption

6.0 W

Ambient operating temperature

5°C (41°F) to 35°C (95°F)

Ambient storage temperature

-20°C (-4°F) to +60°C (140°F)

External dimensions

120 \times 90 \times 188.5 mm

(4 $\frac{3}{4}$ \times 3 $\frac{5}{8}$ \times 7 $\frac{1}{2}$ inches)

Approx. 1,300 g (2 lb 13 oz)

Mass

Digital processor

Input A/D

Gamma

10-bits/color (R, G, B)

STANDARD, PRESET1,

PRESET2, PRESET3

Input LUT

Output LUT

All 10-bit (R, G, B)

All 8-bit (R, G, B)

Processing

Sharpness

Contrast

Masking

Memory

OFF, LOW, MIDDLE, HIGH

-5 to +5

OFF, LOW, MIDDLE, HIGH

Image memory size: 1,280 (H)

\times 1,024 (V) \times 3 (A RGB)

\times 8 (bits)

SCSI: SCSI-2

External interface

Transfer method: Asynchronous

transfer

Data bus width: 8 bits

Termination method: Single-Ended

Input/output and control connectors

SCSI connectors (loop-through):

50-pin, half-pitch

FLASH: X contact (terminal

voltage: Less than 400 V)

RS-232C: D-sub 9-pin (undefined)

FS: Mini-jack

VIDEO: BNC type

S-VIDEO: Mini DIN 4-pin

R, G, B, and SYNC: BNC-type

R, G, B: 0.7 Vp-p, 75 ohms

SYNC: 4 Vp-p, 75 ohms

Note

Pixel skew offset signal is output

as it is.

Others

Camera cable length compensation:

10 m/25 m

Power requirements: 120 V, 50 Hz/

60 Hz

Current consumption: 0.45 A

External dimensions (w/h/d): 211 \times

365 \times 128.5 mm

(8 $\frac{3}{8}$ \times 14 $\frac{1}{8}$ \times 5 $\frac{1}{8}$ inches)

Mass: Approx. 6 kg (13 lb 3 oz)

Accessories supplied

Remote controller (1)

Camera cable (1)

AC power cord (1)

Ferrite cores (4)

3.5-inch floppy disks containing the control software

(2)

Operating Instructions (1)

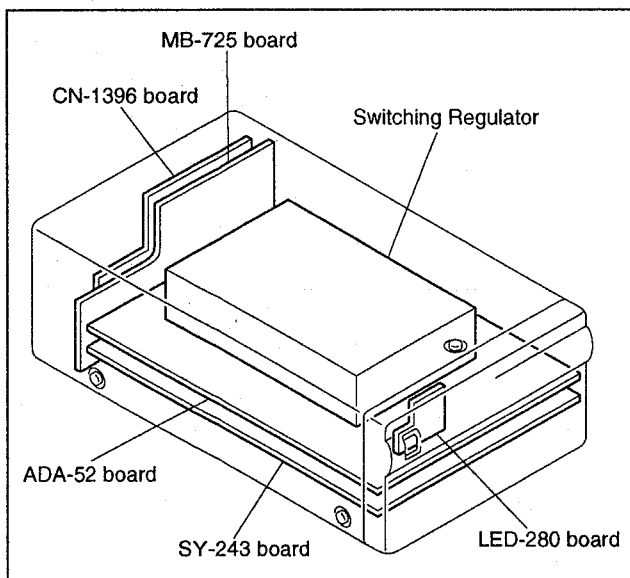
EX 631
EX 630

EXPER

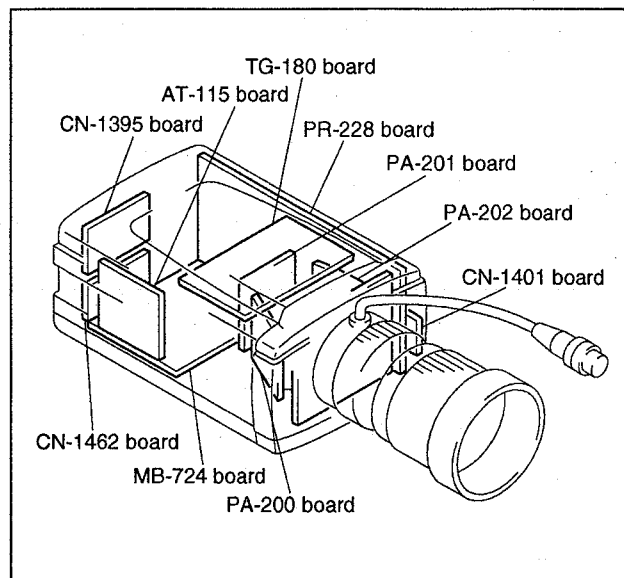
SECTION 2 SERVICE INFORMATION

2-1. BOARD LAYOUT

• Processor block

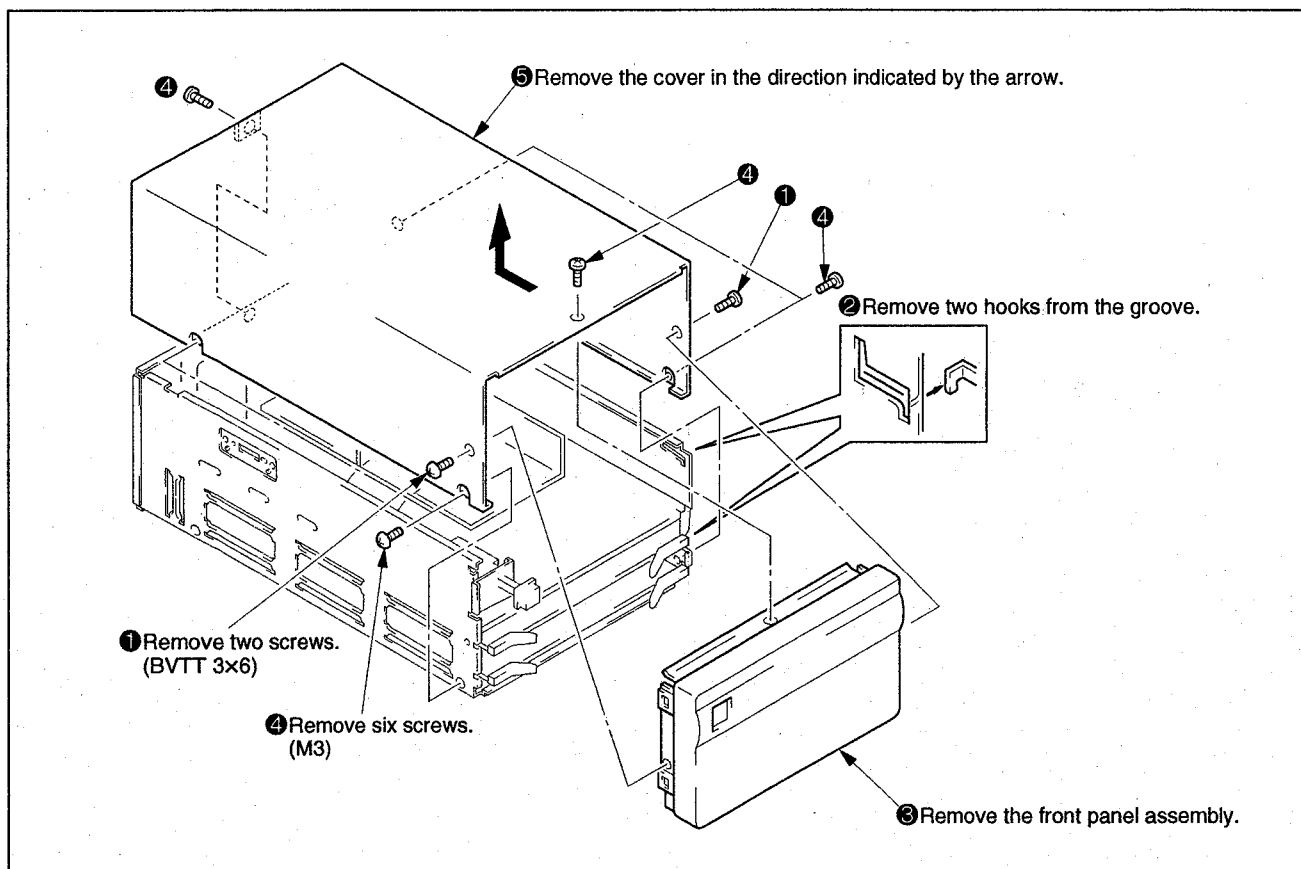


• Camera block

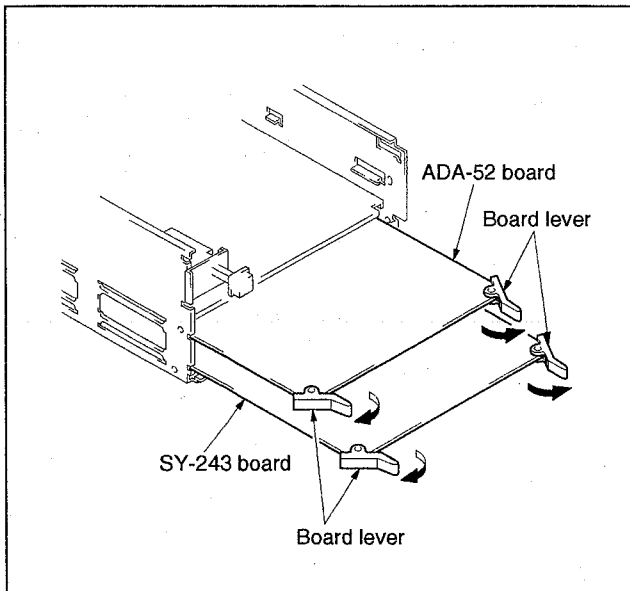


2-2. PROCESSOR BLOCK DISASSEMBLY

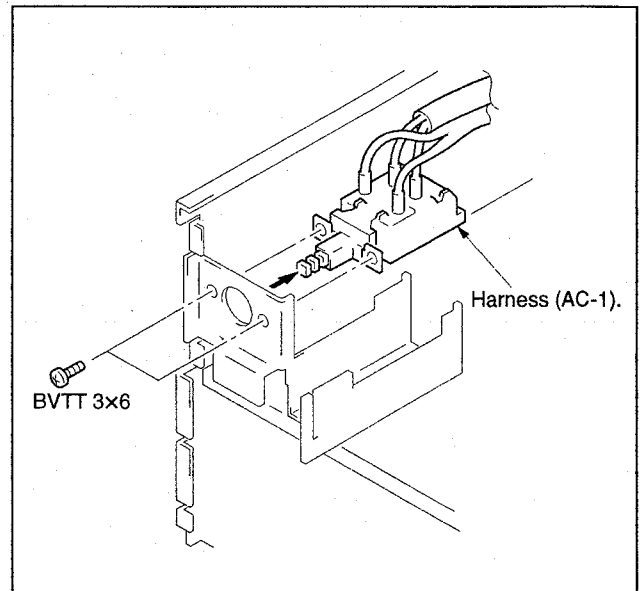
2-2-1. Removal of Cabinet



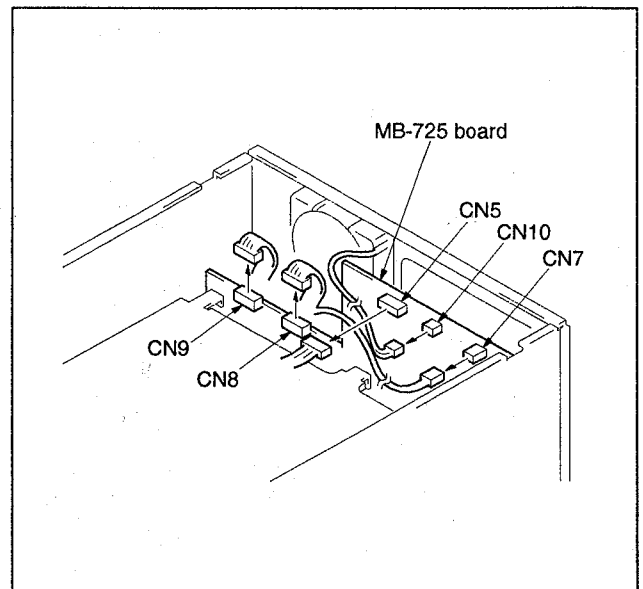
2-2-2. Removal of the ADA-52 and SY-243 Boards



2.

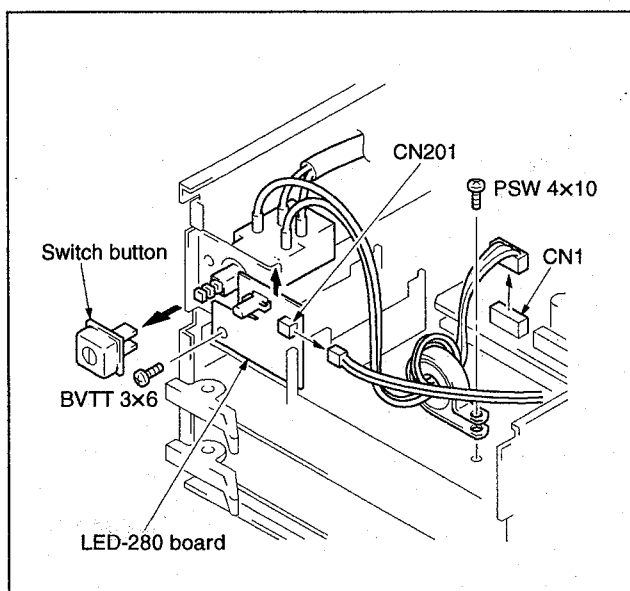


3.



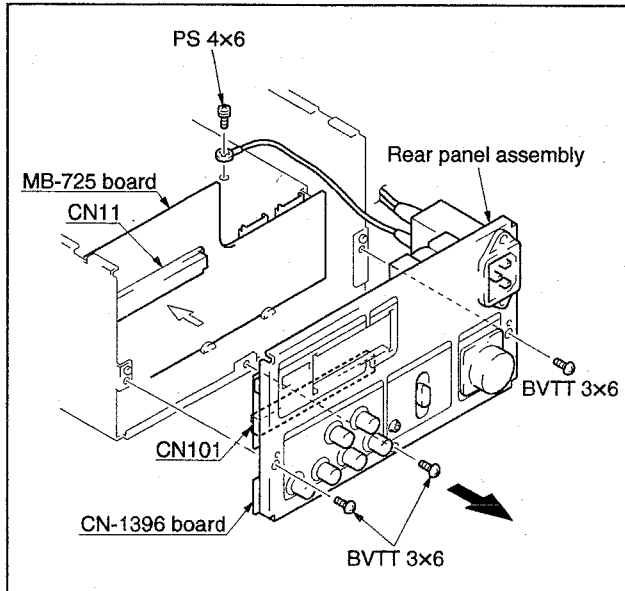
2-2-3. Removal of the Rear Panel Block

1.

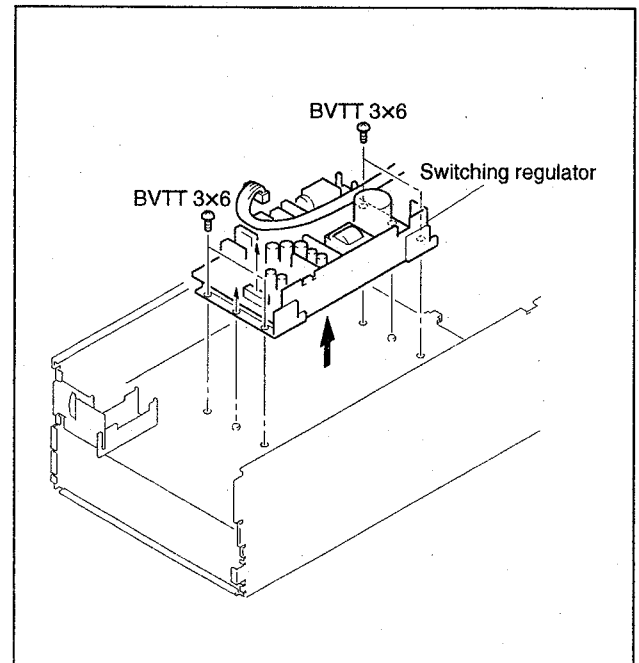


4.

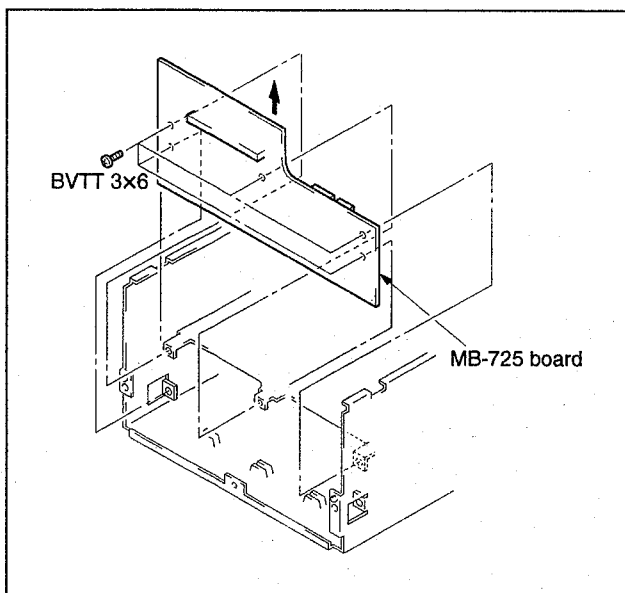
NOTE: When assembling rear panel assembly, connect the CN11 to CN101.



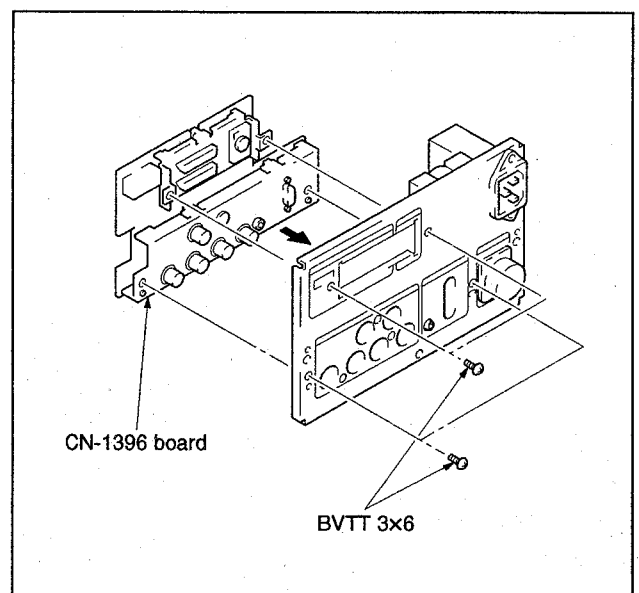
2-2-5. Removal of the Switching Regulator



2-2-4. Removal of the MB-725 Board

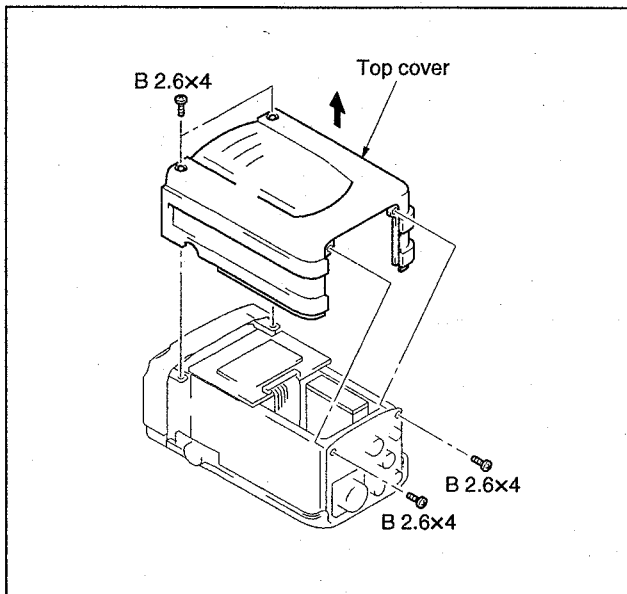


2-2-6. Removal of the CN-1396 Board



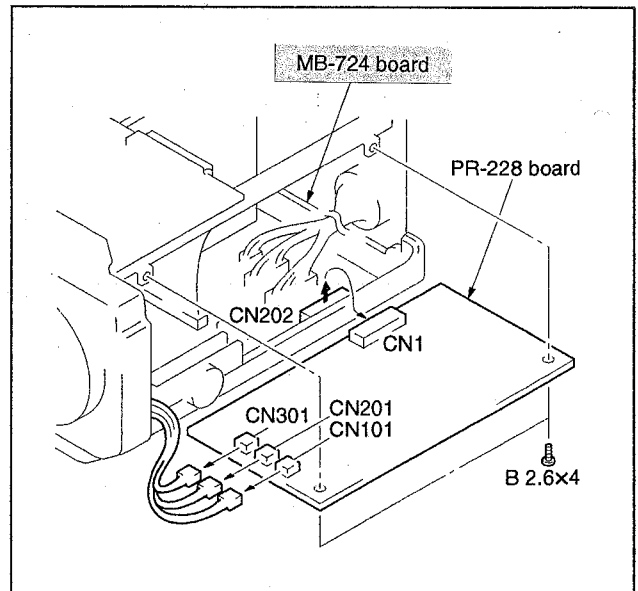
2-3. CAMERA BLOCK DISASSEMBLY

2-3-1. Removal of the Cabinet



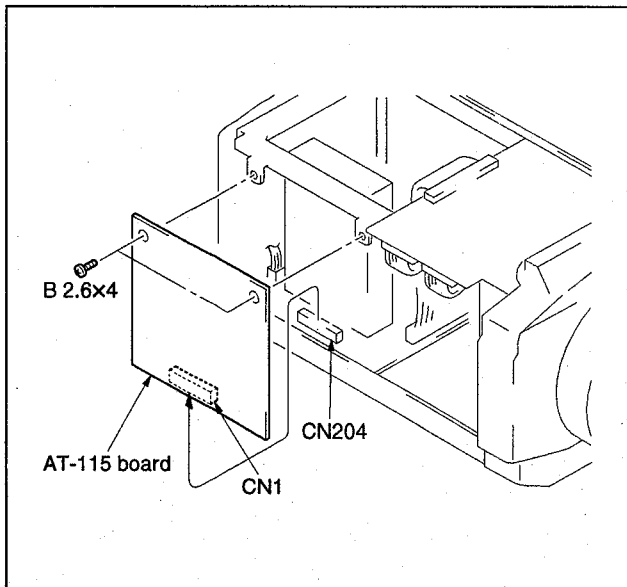
2-3-3. Removal of the PR-228 Board

NOTE: When assembling PR-228 board, connect the CN1 to CN202.

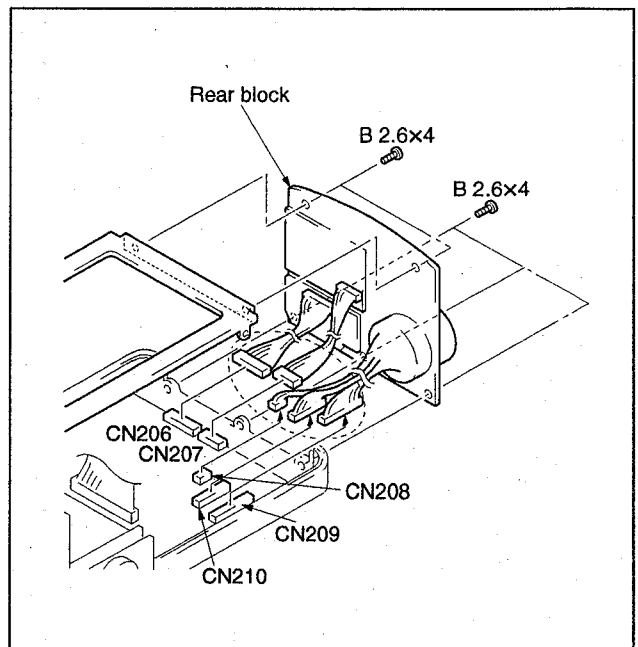


2-3-2. Removal of the AT-115 Board

NOTE: When assembling AT-115 board, connect the CN1 to CN204.



2-3-4. Removal of the Rear Block

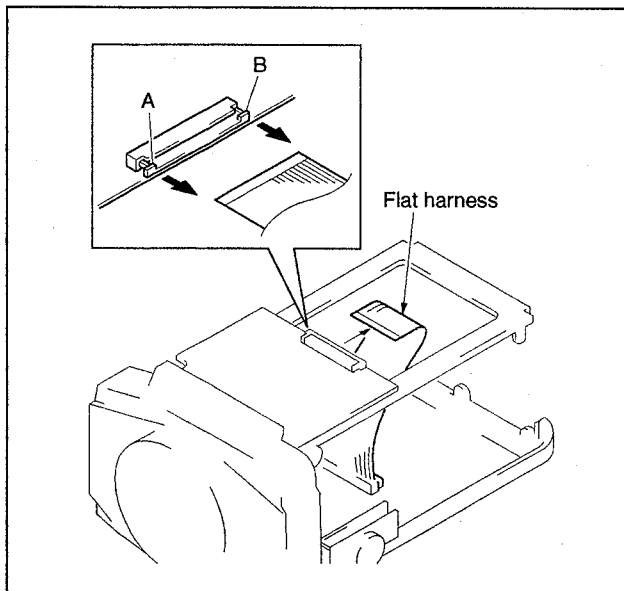


2-3-5. Removal of the Bottom Base Assembly

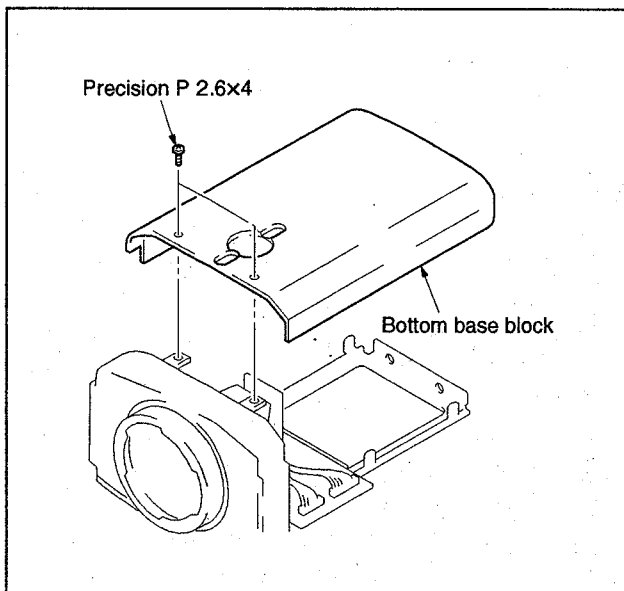
NOTE: When disconnecting the flat harness, pull simultaneously portions A and B in the direction indicated by the arrows and pull out the flat harness.

When connecting the flat harness, firstly, insert the harness into the connector and push simultaneously portions A and B in the opposite direction indicated by the arrows.

1.

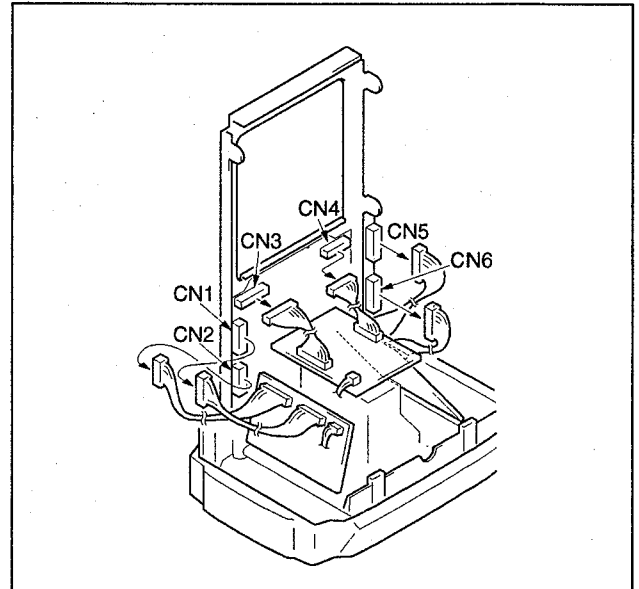


2.

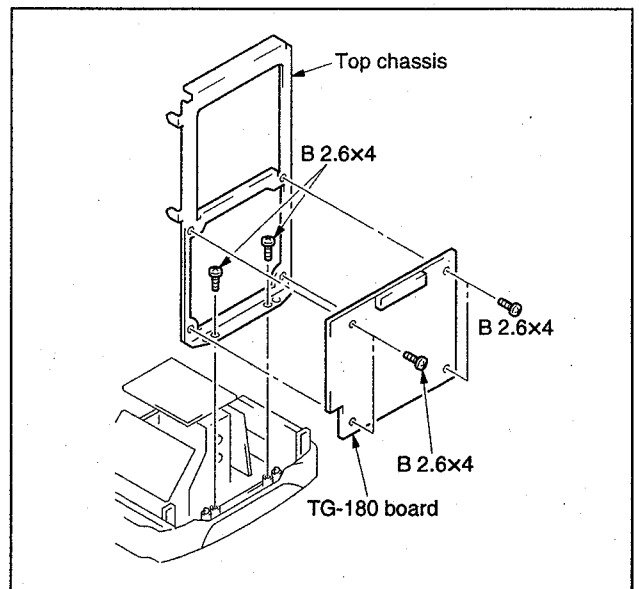


2-3-6. Removal of the TG-180 Board and Top Chassis

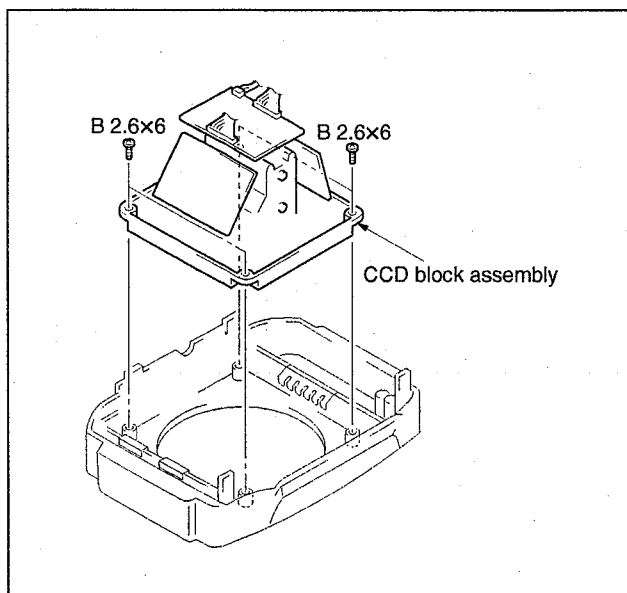
1.



2.



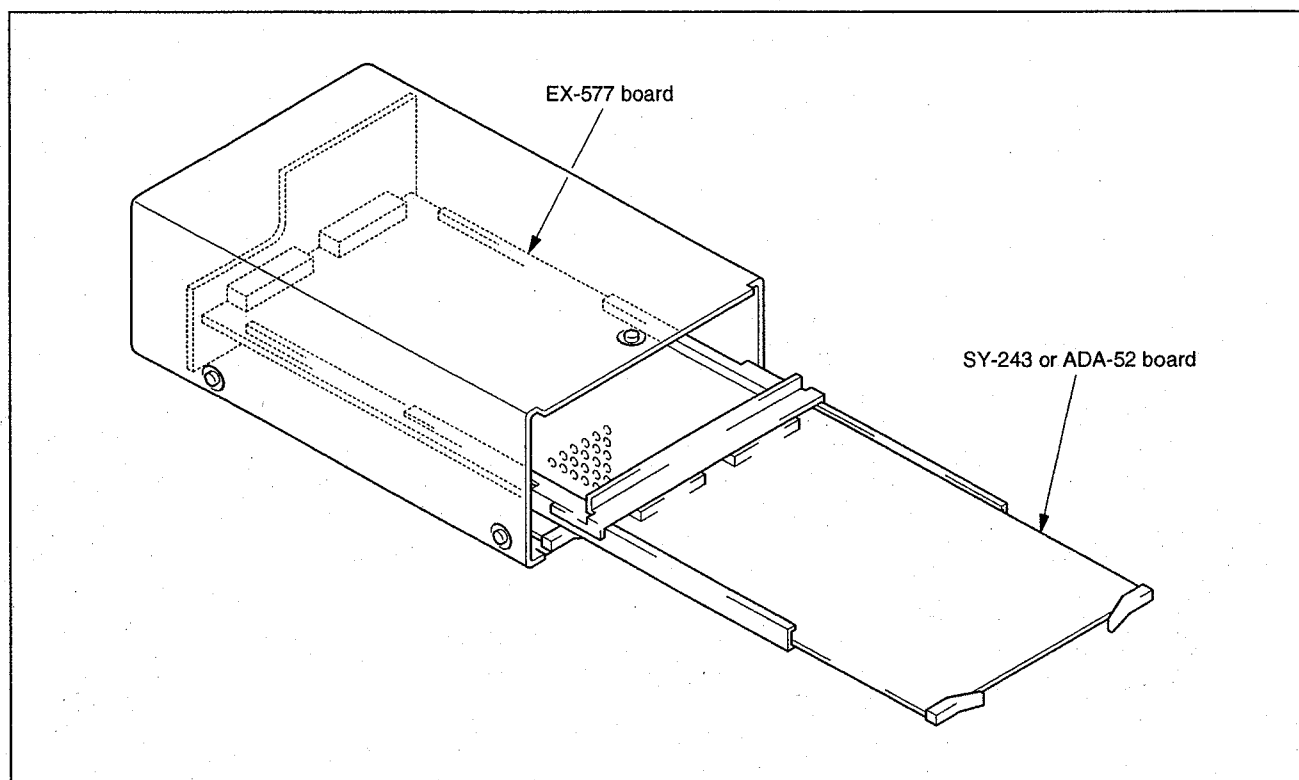
2-3-7. Removal of the CCD Block Assembly



2-4. HOW TO USE EXTENSION BOARD

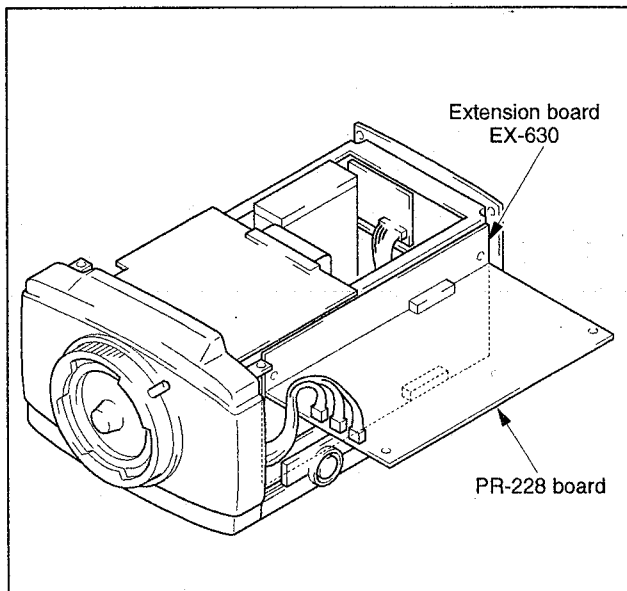
2-4-1. Processor block

- Extension board EX-577
(Sony part No. : J-6276-450-A)

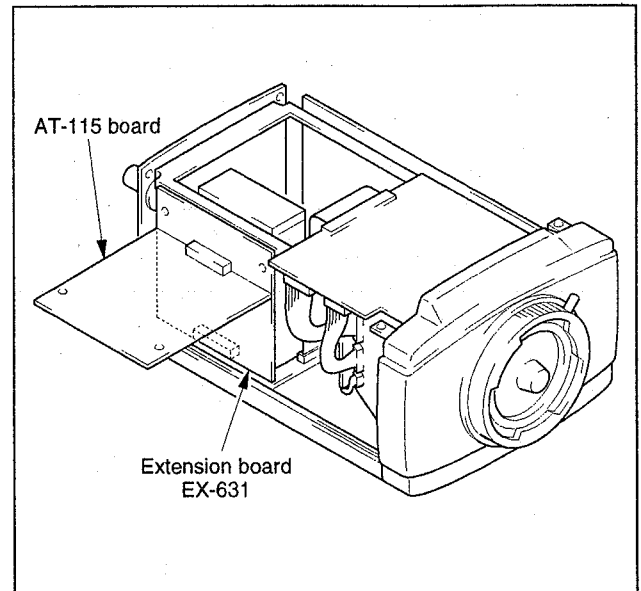


2-4-2. Camera block

- Extension board EX-630
(Sony part No. : J-6276-490-A)



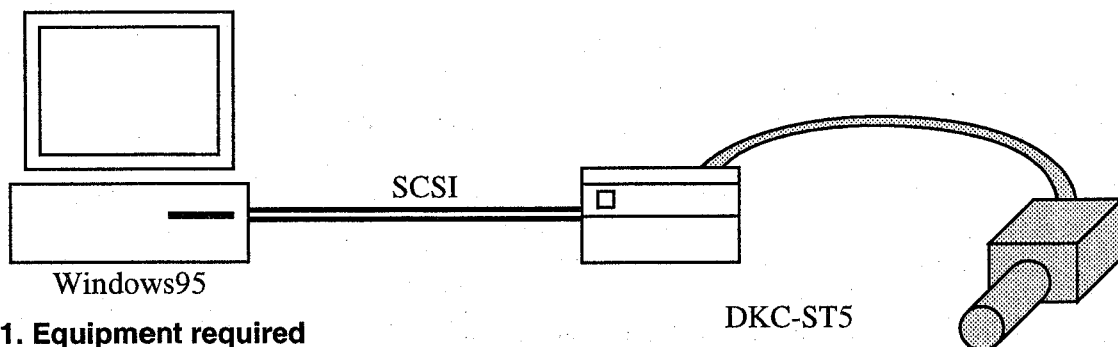
- Extension board EX-631
(Sony part No. : J-6276-500-A)



2-5. AFTER CCD BLOCK IS REPLACED

After replacing CCD block, if photograph would be performed and the picture would be taken in the computer, the noise may be generated. To prevent this, it is needed to memory the defect information of the CCD for the camera.

Connection



2-5-1. Equipment required

(1) Hardware

IBM-PC mutual changeable model

- It has an Intel 80486 or a Pentium processor or it is attached with more than 16M bite main memory.
- SCSI host adapter AHA-1522/2940 series——Adaptec
(Connection between DKC-ST5 and the computer with SCSI cable)

(2) Software

- MS-Window 95
- Adaptec EZ-SCSI V4.5J or more
(Install the ASPI manager.)
- CCD DATA(E) TOOL —— J-6276-700-A (SONY part number)

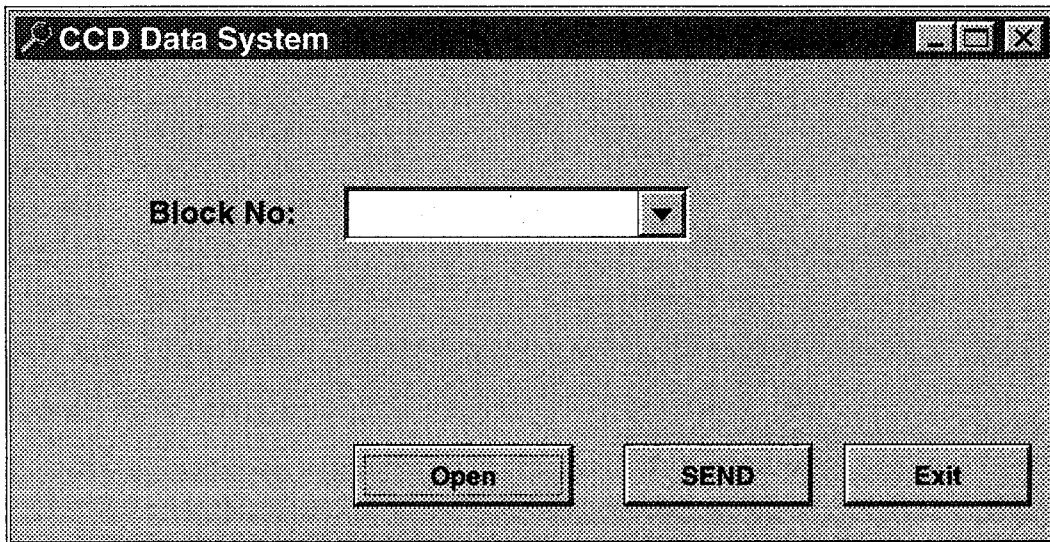
2-5-2. OPERATION DESCRIPTION

(1) Starting of application



If above icon is double-clicked, application is started.

(2) Main dialog box



After application started, main dialog box is indicated.

(3) Selection of file

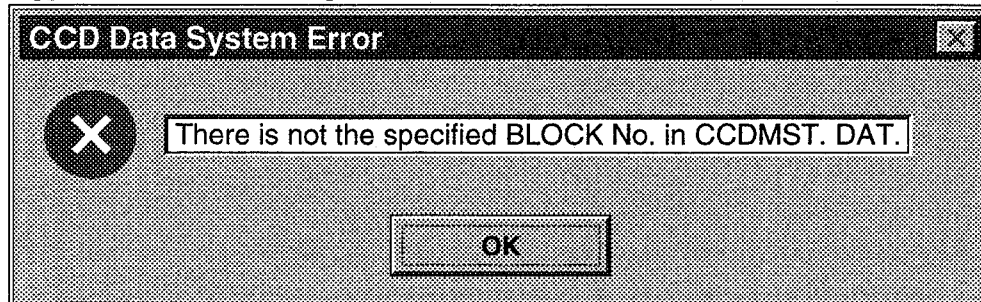
- ① Click the open—button.
- ② Dialog box of file selection is indicated.
- ③ If the file is selected, the block number is registered in reading combo box.

(4) Input of block number

- ① Input by combo box
Push marked ▼ and select the block number by the mouse.
- ② Input by key
 - Key input mode is made by tab key or mouse clicking of the combo box.
 - Key input is performed by keyboard and push the enter key.

③ Error

When unregistered block number is inputted by key, the following message is appeared and it can not be inputted.



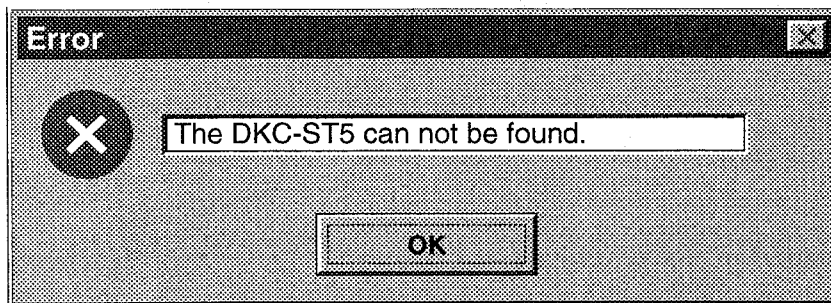
(5) Transmission of defect data

Click the send button and then the defect data is sent to the DKC-ST5.

(6) Finish of application

Click the finish button and then the application is finished.

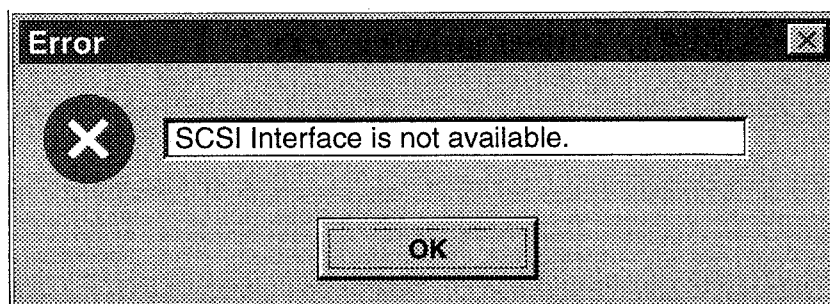
2-5-3. DKC-ST5 INTERFACE



When above message is appeared, DKC-ST5 is not connected to SCSI.

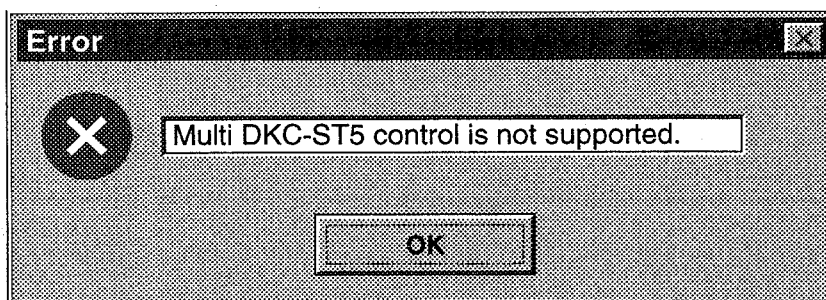
Cause:

- It is not the DKC-ST5.
- The cable is not connected.
- There is a mis-setting of SCSI ID.



When above message is appeared, ASPI driver of 32 bit is not there.

Reinstall the SCSI manager.



When above message is appeared, some DKC-ST5 sets are connected to SCSI.
Connect only one DKC-ST5 to SCSI.

In case, these SCSI interface errors are appeared, SEND button can not be used.

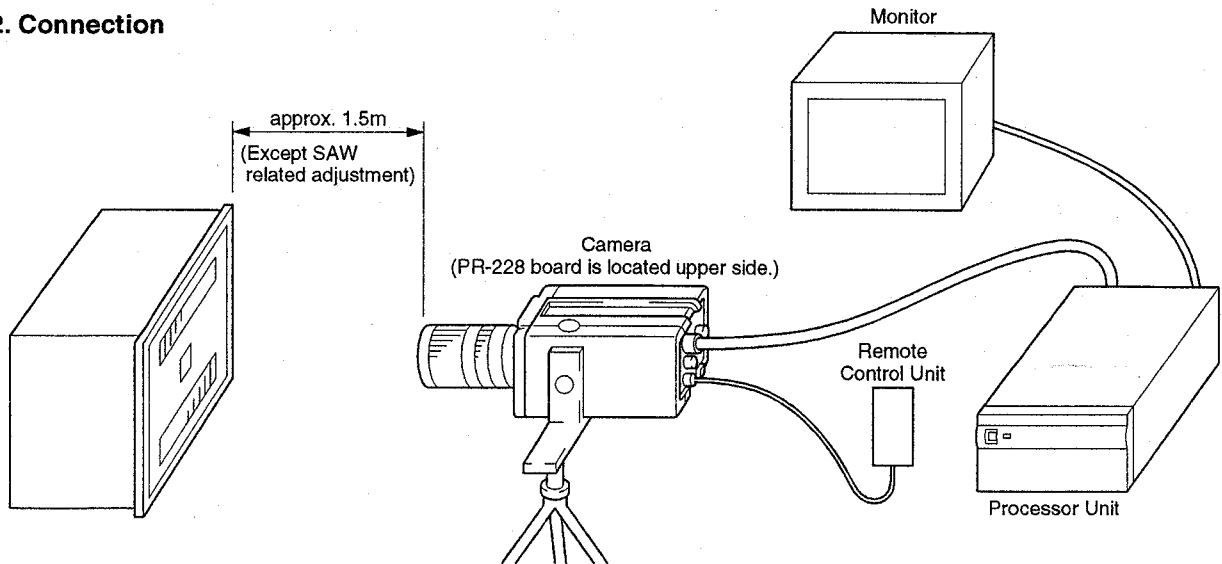
SECTION 3 ALIGNMENT

3-1. PREPARATION

3-1-1. Equipment Required

- Digital voltmeter
- Oscilloscope (100 MHz or more)
- Monitor

3-1-2. Connection



3-1-3. Adjustment mode

Turn on the power and press the **ENTER** key of the remote control more than 5 seconds. The characters on the monitor are changed to green color.

This means that has been entered the adjuntment mode.

[MAIN]
▶EVR ADJUST
IRIS ADJUST
SW SETTING
SHUTTER

3-1-4. Iris Setting

Coincide the cursor to IRIS ADJUST by **↓** key and press the **ENTER** key.
Indication on the monitor is as follows.

[IRIS ADJUST]
CLOSE :
F5.6 : 0
5600K : 0
x3 : 0
▶▷RETURN

Coincide the cursor to F5.6 by **↓** or **↑** key and press the **ENTER** key.

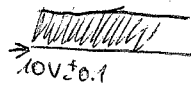
Change the number 0 to -3 by **↓** key and press the **ENTER** key.

Coincide the cursor to ▷RETURN by **↓** or **↑** key and press the **ENTER** key
to return the previous picture.

3-2. VSUB ADJUSTMENT (TG-180)

Conditions for adjustment	spec.	Adjustments
CCD imager voltage <i>U. Ref von Datenblatt</i>	TP3 0±0.1V R-ch	RV4
	TP5 -0.5±0.1V G-ch	RV5
	TP7 0±0.1V B-ch	RV6

3-3. RG DC ADJUSTMENT



Conditions for adjustment	Spec.	Adjustment
clamp pulse voltage  10V±0.1	TP2 10±0.1V R-ch	RV1
	TP4 10±0.1V G-ch	RV2
	TP6 10±0.1V B-ch	RV3

3-4. TERMINOLOGY DEFINITION

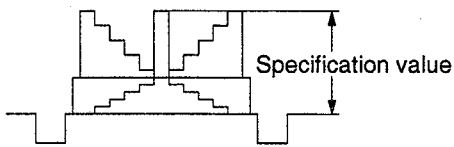
SHADING	Select the CLOSE in the IRIS ADJUST or cover the lens with lens cap.
STANDARD	Select the F5.6:-3 in the IRIS ADJUST and shoot the gray scale.
THE THREE TIMES INTENSITY OF RADIATION	Select the x3:0 in the IRIS ADJUST and shoot the gray scale.
ENTIRELY WHITE	Select the F5.6:-3 in the IRIS ADJUST and contact the lens to the pattern box(white). Lens focus(∞), Zoom is end of tele.
OSCILLOSCOPE TRIGGER	When seeing by H synchronization, ---TP2 When seeing by V synchronization, ---TP1

3-5. EVR INITIALIZATION

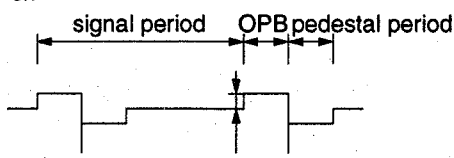
Select the EVR ADJUST and select the INIT.

Change indication to YES by  and  keys, and press the **ENTER** key to initialize the EVR.

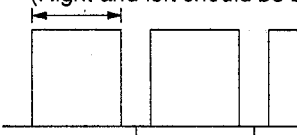
3-6. INPUT LEVEL ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: standard White level (H synchronization)	TP201 115 ± 10 mVp-p G-ch TP101 120 ± 10 mVp-p R-ch TP301 60 ± 10 mVp-p B-ch 	●RV202 ●RV103 ●RV302

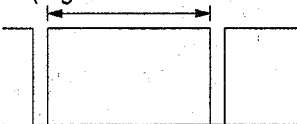
3-7. DARK ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: Shading White level (H synchronization)	TP503 Within ± 10 mV G-ch TP403 Within ± 10 mV(Without noise) R-ch TP603 Within ± 10 mV B-ch  This step should be become to 0.	●EV19 ●EV7 ●EV31

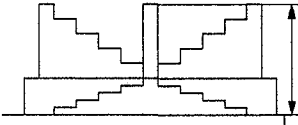
3-8. HSAW ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: entirely white Difference between white levels (H synchronization)	<p>TP505 Within ± 20 mV(Without noise) G-ch</p> <p>TP405 Within ± 10 mV(Without noise) R-ch</p> <p>TP605 Within ± 10 mV(Without noise) B-ch</p> <p>Should be flat. (Right and left should be balanced.)</p> 	<p>●EV16</p> <p>●EV4</p> <p>●EV28</p>

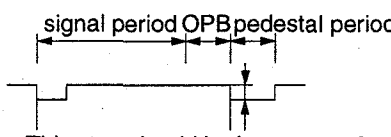
3-9. VSAW ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: entirely white Difference between white levels should be flat. right and left should be balanced. (V synchronization)	<p>TP505 Within ± 20 mV(Without noise) G-ch</p> <p>TP405 Within ± 10 mV(Without noise) R-ch</p> <p>TP605 Within ± 10 mV(Without noise) B-ch</p> <p>Should be flat. (Right and left should be balanced.)</p> 	<p>●EV17</p> <p>●EV5</p> <p>●EV29</p>

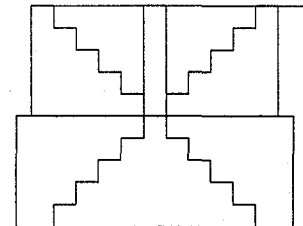
3-10. GAIN ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: Standard White level (H synchronization)	TP505 $550 \pm 20 \text{ mV}$ G-ch TP405 $550 \pm 20 \text{ mV}(3200\text{K})$ R-ch TP605 $550 \pm 20 \text{ mV}(3200\text{K})$ B-ch 	●EV20 ●EV2 ●EV26

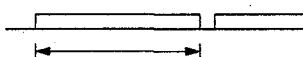
3-11. BLACK 1 ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: Shading Step between pedestal and OPB (H synchronization)	TP503 $\pm 10 \text{ mV}(\text{Without noise})$ G-ch TP403 $\pm 10 \text{ mV}(\text{Without noise})$ R-ch TP603 $\pm 10 \text{ mV}(\text{Without noise})$ B-ch  <p>This step should be become to 0.</p>	●EV18 ●EV6 ●EV30

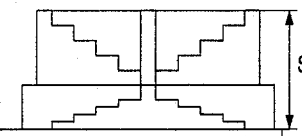
3-12. PRENEE ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: The three times intensity of radiation. (H synchronization)	<p>TP505 1130 ± 40 mV G-ch</p> <p>TP405 1130 ± 40 mV R-ch</p> <p>TP605 1130 ± 40 mV(Without noise) B-ch</p> 	<p>●EV15</p> <p>●EV3</p> <p>●EV27</p>

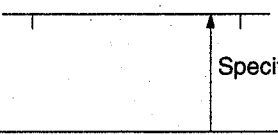
3-13. V SAW ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: Entirely white (V synchronization)	<p>Difference between TP405 and TP505 Within ± 10 mV(Without noise) R-ch</p> <p>Difference between TP605 and TP505 Within ± 10 mV(Without noise) B-ch</p>  <p>Should be flat. (Right and left should be balanced.)</p>	<p>●EV5</p> <p>●EV29</p>

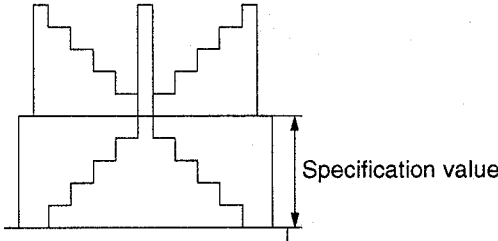

3-14. γ INPUT LEVEL ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: Standard White level (H synchronization)	TP501 $470 \pm 10 \text{ mVp-p}$ G-ch TP401 $470 \pm 10 \text{ mVp-p}$ R-ch TP601 $470 \pm 10 \text{ mVp-p}$ B-ch 	●RV501 ●RV401 ●RV601

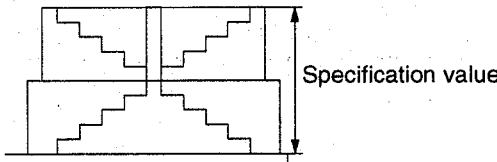

3-15. PEDESTAL ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: Shading Optical black DC voltage	TP503 $2.6 \pm 0.1 \text{ V}$ G-ch TP403 $2.6 \pm 0.1 \text{ V}$ R-ch TP603 $2.6 \pm 0.1 \text{ V}$ B-ch  GND	●RV506 ●RV406 ●RV606

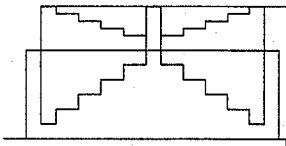

3-16. γ ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: Standard	<p>TP503 cross level Turn the RV505 fully clockwise. 800 ± 40 mV G-ch</p>  <p>The difference between TP403 and TP503. Turn the RV405 fully clockwise. The waveform should be flat. Within ± 20 mV(without noise) R-ch</p> <p>The difference between TP603 and TP503. Turn the RV605 fully clockwise. The waveform should be flat. Within ± 20 mV(without noise) B-ch</p> 	<p>●RV504</p> <p>●RV404</p> <p>●RV604</p>

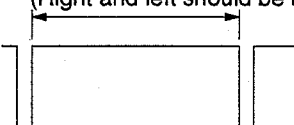

3-17. OUTPUT LEVEL ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: Standard	<p>TP504 White level 2000 ± 40 mVp-p G-ch</p>  <p>The difference between TP404 and TP504. Within ± 10 mV R-ch</p> <p>The difference between TP604 and TP504. Within ± 10 mV B-ch</p> 	<p>●RV508</p> <p>●RV408</p> <p>●RV608</p>

3-18. KNEE ADJUSTMENT

Conditions for adjustment	spec.	Adjustments
Mode: The three times intensity of radiation	<p>TP503 White level 2140 ± 100 mV G-ch</p>  <p>The difference between TP403 and TP503. The waveform should be flat. Within ± 20 mV(without noise) R-ch</p> <p>The difference between TP403 and TP503. The waveform should be flat. Within ± 20 mV(without noise) B-ch</p> 	<p>RV507</p> <p>RV407</p> <p>RV607</p>

3-19. V SAW ADJUSTMENT (ALL PIXELS)


Conditions for adjustment	spec.	Adjustments
Mode: Entirely white (V synchronization)	<p>TP505 The difference between white levels Within ± 20 mV(without noise)</p> <p>Should be flat. (Right and left should be balanced.)</p>  <p>The difference between TP405 and TP505. Within ± 10 mV(without noise)</p> <p>The difference between TP605 and TP505. Within ± 10 mV(without noise)</p> <p>Should be flat. (Right and left should be balanced.)</p> 	<p>V SAW(G-ch)</p> <p>V SAW(R-ch)</p> <p>V SAW(B-ch)</p>

3-20. 5600K COLOR TEMPERATURE CONVERSION SETTING

Cover the lens with C14 filter. Select "5600K:0" at IRIS ADJUST.

Shoot the gray scale chart.

3-21. GAIN ADJUSTMENT (5600K)

Conditions for adjustment	spec.	Adjustments
(H synchronization)	The difference between TP403 and TP503. Within ± 10 mV R-ch	5600K(R-ch)
	The difference between TP603 and TP503. Within ± 10 mV B-ch	5600K(B-ch)
		

3-22. SETTING VALUE WRITTING

Conditions for adjustment	spec.	Adjustments
The setting value is written in EEPROM.	Select ALL SAVE at EVR ADJUST and press the ENTER key.	ALL SAVE

SECTION 4

CIRCUIT DESCRIPTION

4-1. PROCESSOR SECTION

[1] OUTLINE

The SY-243 board mainly consists of a system block, image processing block, and FF clock circuit block.

The system block is constituted by 1M-bit EPROM x 2 (IC39 for lower EPROM and IC40 for upper EPROM) for a program; 4M-bit DRAM (IC27) for system working; nonvolatile 64K-bit EEPROM x 2 (IC22 and IC23); 2M-bit flash memory (IC24) required to load an external program in future; a system controller gate array (IC31) with a character generation function that displays characters on the monitor by using an address decoder, PI/O decoder, DMA timing controller, programmable wait generator, 10-bit programmable counter, C-sync detector, and 1M-bit SRAM (IC32); a peripheral circuit of CPU (IC19) such as IC29 for a real-time clock, IC25 for an RS-232C controller, and an RS-232C driver (IC21); and CPU (IC19) that controls the peripheral circuit.

The image processing block is constituted by a gate array (IC500), incorporating a lookup table (LUT), that can write the image data in VRAMs (IC509 to IC514) for monitor output and that can write and read the input image in and from frame memory (16M-bit DRAM x 3 (IC506, IC507, and IC508))(DMA transfer); gate arrays (IC501 and IC502) that interpolate the slantly shifted pixel image and have a contrast and sharpness function; a gate array (IC503) that can read the image data from VRAMs (IC509 to IC514) for monitor output, that can write and read the data from 4M-bit DRAMs (IC515, IC516, and IC517), and that incorporates a masking function and monitoring lookup table (LUT); SPC (IC504) for SCSI; and an active terminator (IC505).

The FF clock circuit block is constituted by IC100, digital delay lines (IC101, IC102, and IC103), and a sync separator (IC104), so as to generate the WCK clock (20 MHz) locked to the WHD clock from a camera head.

[2] SYSTEM BLOCK

(1) Address decoder, PI/O decoder, and PI/O

The memory map and I/O map consist of system controller gate array IC31, and IC1, IC2, IC3, IC4, and IC5 (refer to pages 4-3 to 4-5).

The $\overline{\text{OUT1}}$ to $\overline{\text{OUT5}}$ output signals of IC31 are input to the CK and input pins of IC28 and IC7, and the CK pins of IC37, IC30, IC529, and IC38, respectively. The $\overline{\text{IN1}}$ to $\overline{\text{IN4}}$ output signals of IC31 are input to the $\overline{\text{1G}}$ and $\overline{\text{2G}}$ pins of IC26, IC36, IC35, and IC34, respectively to obtain the PI/O configuration shown on page 4-6 and control the system.

(2) Character generator

The character generator consists of system controller gate array IC31, 1M-bit SRAM IC32, and IC33.

The characters and lines such as menu, headline, chin line, and print frames displayed on the monitor are written in IC32 from CPU (IC19)(1-bit 768 pixels x 682 lines x 2 are provided as a character image) and output from the CR KEY, CR R, CR G, and CR B pins. The CR KEY signal corresponds to the CR R + CR G + CR B signals.

These four signals are superimposed on a picture signal in the former stage of a D/A converter on the ADA-52 board and output from the monitor.

(3) Interrupt controller

The interrupt controller consists of IC26, IC28, IC5, IC6, IC7, IC10, and IC11.

The $\overline{\text{INTP01}}$ input signal of IC19 is set low and recognized as an interrupt when the $\overline{\text{HK INT}}$ signal at the falling edge in IC501 or the $\overline{\text{FM INT}}$ signal of IC500 is set low or when the $\overline{\text{LM INT}}$ signal of IC503 is set low. The type of the above three interrupts that occurred can be recognized by reading $\overline{\text{IN1}}$ data. (Refer to page 4-6)

(4) Real-time clock block

The real-time clock block consists of IC29, BH1, D2, Q1, and Q2.

The power of IC29 is backed up by BH1 during the power-off sequence. In addition to a timer function, IC29 also has internal SRAM. Therefore, IC29 memorizes the zoom, focus, and iris values of a lens.

[3] FF CLOCK CIRCUIT BLOCK

This block consists of two 20-MHz crystal oscillators; IC100; digital delay lines (IC101 and IC102), and IC105, IC108, and IC107; IC103 and IC106; a sync separator (IC104); and IC105, IC111, IC114, IC110, IC108, IC109, and IC107.

IC100 has a function that gate-delays a clock of 20 MHz, generates a multi-phase clock, compares the clock with the $\overline{\text{WHD}}$ signal from the camera head in phase, and selects a clock with the nearest phase. The digital delay lines (IC101 and IC102), and IC105, IC108, and IC107 are used to eliminate the noise in an output clock of 20 MHz. IC103 and IC106 are used to adjust the phase level for an input picture signal. The sync separator (IC104) detects the $\overline{\text{WHD}}$ signal from the camera head. The WEXT output signal of IC31 is set high if a $\overline{\text{WHD}}$ signal exists (that is, the connection with the camera head is performed using a cable) when the output signal of IC104 is input to the WCSNC pin of IC31. The WEXT output signal is set low if no $\overline{\text{WHD}}$ signal exists (that is, the connection with the camera head is not performed using a cable). However, when connection is done using the WEXT output a signal, WEN and XHD signals are used as WEN and $\overline{\text{WHD}}$ signals from the camera head, and a clock of 20 MHz is synchronized at the falling edge of a $\overline{\text{WHD}}$ signal. When no connection is done using the WEXT output signal, a WEN signal is generated by the RFLD signal from the ADA-52 board and an XHD signal is used as an $\overline{\text{RHD}}$ signal. A clock of 20 MHz is selected by IC105, IC111, IC114, IC110, IC108, IC109, and IC107 so that it is synchronized at the falling edge of an $\overline{\text{RHD}}$ signal.

In addition to WEN and $\overline{\text{WHD}}$ (reference signal of IC500) signals, a $\overline{\text{WVD}}$ signal (write reference signal of IC19) is output as a sync signal from the camera head. Moreover, a flash OUT signal that controls the solid state relay (IC1) on the MB-725 board, and TXD and RXD signals that are used for communication with the camera head CPU are output. The TXD and RXD signals are a differential signal. They conform to the RS-422 standard. These signals exchange each data via differential driver IC17.

Address	Device	Block No	$\overline{\text{CS}}$	Wait	Access byte
FF800000H to FFFFFFFFH (Actually, FFFC0000H to FFFFFFFFH)	EPROM (2M) IC39, IC40	3	$\overline{\text{CS3}}$		Upper (D15 to 8) Lower (D7 to 0)
FF000000H to FF7FFFFFH (Actually, FF7C0000H to FF7FFFFFH)	Flash Mem (2M) IC24	3	$\overline{\text{CS3}}$		Upper Lower
3F000000H to 3FFFFFFFH (Actually, 3FF80000H to 3FFFFFFFH)	DRAM (4M) IC27	0	DRAM MODE	3	Upper Lower
7F000000H to 7FFFFFFFH (Actually, 7FFFC000H to 7FFFFFFFH)	EEPROM (128k) IC22, IC23	1	$\overline{\text{CS1}}$		Upper Lower

Note: Addresses A24 through A29 are not used.

Table 4-1 Memory Map

Address	Device	Block No	\overline{CS}	Wait	Access byte
C0000000H to C00000FFH	Inside of internal peripheral I/O register IC19	3	—	Makes one or two waits forcibly	Upper Lower
BF800000H to BF807FFFH	LUT1 (for input) IC500 (incorporating FMC G/A)	2	\overline{FWCS}	External \overline{WAT}	Lower
BF800000H to BF8007FFFH BF800800H to BF800FFFFH BF801000H to BF8017FFFH	R-ch LUT1 G-ch LUT1 B-ch LUT1				
BF808000H to BF80FFFFH	LUT2 (for monitor) IC503 (incorporating LM G/A)	2	\overline{LWCS}	External \overline{WAT}	Lower
BF808000H to BF8081FFFH BF808200H to BF8083FFFH BF808400H to BF8085FFFH	R-ch LUT2 G-ch LUT2 B-ch LUT2				
BF880000H to BF88FFFFH	PI/O and SYNC G/A register IC31	2			Upper
BF980000H to BF98007FH	FMC G/A register IC500	2	\overline{FMCS}	External \overline{WAT}	Lower
BF980080H to BF9800FFFH	LM G/A register IC503	2	\overline{LMCS}	External \overline{WAT}	Lower
BF980100H to BF98013FH	HK1 G/A register IC501	2	$\overline{HK1CS}$		Lower
BF980140H to BF98014FH	HK2 G/A register IC502	2	$\overline{HK2CS}$		Lower
BF980150H to BF98015FH	serial controller IC25	2	\overline{SCCS}		Lower
BF980160H to BF98017FH	SPC IC504	2	\overline{SPCCS}		Lower
BFA00000H to BFA07FFFH	Flame Memory IC500 window	2	\overline{FMWCS}	External \overline{WAT}	Lower
BFA00000H to BFA00FFFFH BFA01000H to BFA01FFFFH BFA02000H to BFA02FFFFH	R-ch FM window G-ch FM window B-ch FM window				

SYNC G/A
EECS

SYNC G/A
 \overline{FMCS}

SYNC G/A
 \overline{ESCS}

SYNC G/A
 \overline{MSCS}

SYNC G/A
 \overline{FWCS}

(To next page)

Address	Device	Block No	CS	Wait	Access byte	
BFA08000H to BFA0FFFFH	Background frame memory window IC503	2	$\overline{\text{LMWCS}}$	External $\overline{\text{WAT}}$	Lower	SYC G/A $\overline{\text{FWCS}}$
BFA08000H to BFA087FFH BFA08800H to BFA08FFFH BFA09000H to BFA097FFH	R-ch B.G.M. window G-ch B.G.M. window B-ch B.G.M. window					
BFB00000H to BFBFFFFFH (Actually, BFB00000H to BFB3FFFFH)	Character RAM IC32	2	$\overline{\text{GRAMCS}}$		Upper	SYC G/A $\overline{\text{GRAMCS}}$

Notes: 1. Addresses A24 through A29 are not used.
2. For only an internal peripheral I/O register, addresses A8 through A29 are not used.

Table 4-2 I/O Map

Address	R/W	D15 (D7)	D14 (D6)	D13 (D5)	D12 (D4)	D11 (D3)	D10 (D2)	D9 (D1)	D8 (D0)	byte	
BF880027H	(W)	—	—	—	INT MASK HK G/A (IC501) Without camera	—	—	—	INTCLR HK G/A (IC501)	Upper	
BF880028H	(W)	—	—	RELAY ON	Entire pixel mode twice normal speed	RAW DATA	HKRST (IC501, IC502)	C/BW sel	SOG	Lower	
BF88002BH	(W)	—	Power LED	SC Control (IC25) C/D B/A		WR	RTC Control (IC29) SIN SCK		CSO	Upper	
BF88002DH	(W)	FM Random SEL RN SEL 0 through 3					FM Capture SEL RT SEL 0 through 3				Upper
BF88002EH	(W)	LEDs for adjustment and check									Lower
BF880000H	(R)	(IC22, 23) EE PROM Ready	(IC24) Flash MEM Ready	(IC29) RTC S OUT	—	—	LM G/A (IC503)	FMC G/A (IC500)	HK G/A (IC501)	Lower	
BF880002H	(R)	0	—	—	DIP	0	SW	—	SCSI ID 3	Lower	
BF880004H	(R)	—	—	—	0	0	—	—	EXT YES/NO	Lower	
BF880006H	(R)	DIP switches (for adjustment)									Lower

Table 4-3 P I/O

Notes:

1. The C/BW SEL signal selects whether to output RET video, video OUT, and S OUT signals as a color or black-and-white signal. The C/BW SEL signal is set high during normal operation.
2. The SOG signal selects whether to superimpose a C-SYNC signal on the G OUT signal of R, G, and B OUT signals.
3. The RT SEL 0 through 3 signals change when a WEN signal is synchronized.
4. The RN SEL 0 through 3 signals change when an HD signal is synchronized.
5. Addresses BF880027H through BF88002FH are set to 0 after POC.
6. The raw data signal is set to 1 when raw data is transferred by SCSI. For other operations, this signal is set to 0.
7. EXT YES/NO indicates whether the camera is connected. Camera connected = High (1)
8. The RELAY ON signal is set to 1 when relay RY1 on the MB-725 board is turned on. It is set to 0 when relay RY1 is turned off.
9. RT SEL 3 through 0 : 0, 1, 2 through 9, A through F
RN SEL 3 through 0 : 0, 1, 2 through 9, A through F
Normal state Service Option NO sel
state FM FM

[4] IMAGE PROCESSING BLOCK

(1) Live image display

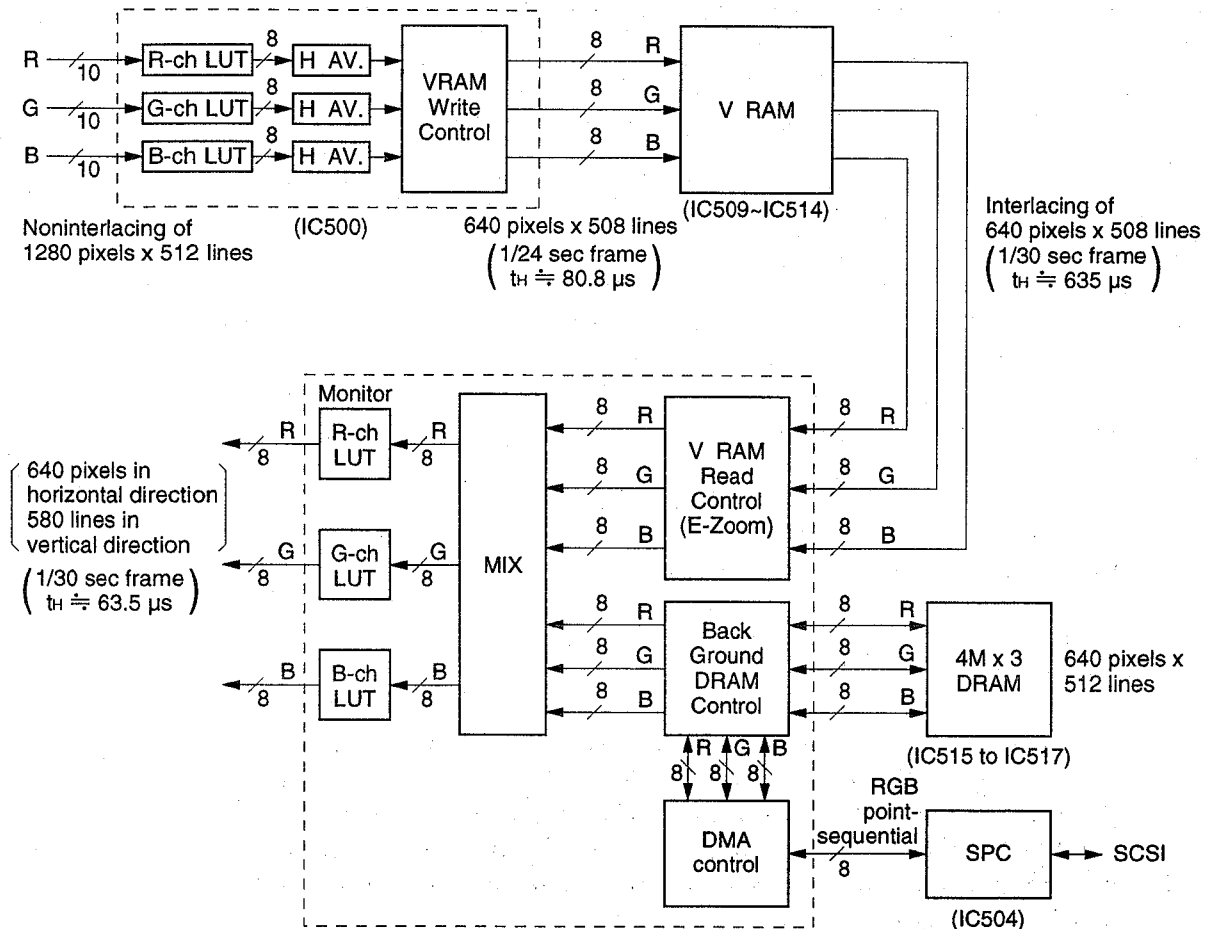


Fig. 4-1 Flow of Image Data in Live State

In the DKC-ST5, the entire pixel read mode (effective pixel of 1280 pixels x 1024 lines) and the twice normal speed mode (effective pixel of 1280 pixels x 512 lines) in which the sum of two lines is output are provided as the CCD read mode. In the live state, data is read in the twice normal speed mode.

Two-line average analog R, G, and B signals are output from the camera head, passed through an analog circuit such as a differential amplifier, cable compensation circuit, sample-and-hold circuit on the processor side, and converted from analog to digital using an A/D converter (the processing described above is performed on the ADA-52 board). The resultant signals are sent to the SY-243 board, latched using a clock of 20 MHz by IC518, IC519, IC520, and IC521, and input to IC500. In IC500, these signals are then passed through a 10-bit lookup table and converted into eight-bit R, G, and B signals, respectively. The converted signals are equalized in the horizontal direction by two pixels and alternately written in VRAMs (IC509 through IC514) for every line in the order of odd, even, and odd.

The picture size is 640 pixels x 508 lines, 1/24 sec frame (WEN period), and $t_{H} \approx 80.8$ usec (XHD (\overline{WHD}) period). The throughput rate is 20 MHz.

For configuration of VRAM, IC509 is used for an R-channel odd field, IC510 for an R-channel even field, IC511 for a G-channel odd field, IC512 for a G-channel even field, IC513 for a B-channel odd field, and IC514 for a B-channel even field.

The image from VRAM is read by IC503. The normal live image is input from MRO through 7, MGO through 7, and MBO through 7 pins to IC503 and output from MRO0 through 7, MGO0 through 7, and MBO0 through 7 pins through R-, G-, and B-channel lookup tables for a monitor. The image data is then passed through a buffer consisting of IC537, IC538, and IC539 and character-superimposed on the ADA-52 board. After that, the image data is displayed on the monitor through a D/A converter, RGB encoder, and 75Ω driver. The image from VRAM is read in picture size of 640 pixels x 508 lines, 1/30 sec frame (double period of \overline{RVD}), and $t_{H} = 63.5$ usec (\overline{RHD} period), and at a throughput rate of 12.283 MHz. For $RFLD = 0$, the image is read from the odd memory of VRAM by interlacing. For $RFLD = 1$, it is read from the even memory of VRAM by interlacing. The image from VRAM is written and read independently. In other words, VRAMs (IC509 through IC514) are used as buffer memory for rate conversion.

The center of the monitor screen becomes double when the E-zoom key on the remote control unit is pressed. In this case, one-pixel data is simply expanded in the horizontal and vertical directions by two pixels. The expansion is performed in IC503 during read operation.



A background image is described below.

The background image memory consists of three 4M-bit DRAMs (IC515 for R channel, IC516 for G channel, and IC517 for B channel). The image memory is input through SPC (SCSI protocol controller) IC504 in a processor to the ID0 to ID7 pins of IC503 when an image of 640 pixels x 512 lines x R.G.B is point-sequentially transferred from a computer by SCSI. IC504 and IC505 (point-sequential DMA) are subject to handshaking by \overline{DREQ} , \overline{DACK} , and \overline{DBWR} control signals. The background image data sent to IC503 is written in IC515 through IC517 described above.

The written image data is synchronized with the read timing of VRAM when the fame ON/OFF key on the remote control unit is pressed (\overline{RVD} synchronization in the vertical direction, \overline{RHD} synchronization in the horizontal direction, and throughput rate of 12.283 MHz). In this case, even lines (0, 2, 4, etc.) for $RFLD = 0$ or odd lines (1, 3, 5, etc.) for $RFLD = 1$ are read from DRAMs (IC515 through IC517) to the DR0 through 7, DG0 through 7, and DB0 through 7 pins in the high-speed page mode (interlacing).

In IC503, the average data (mix data) for VRAM image data is passed through a lookup table for monitor and output from the MRO0 through 7, MGO0 through 7, and MBO0 through 7 pins.

(2) Memory image display and capture

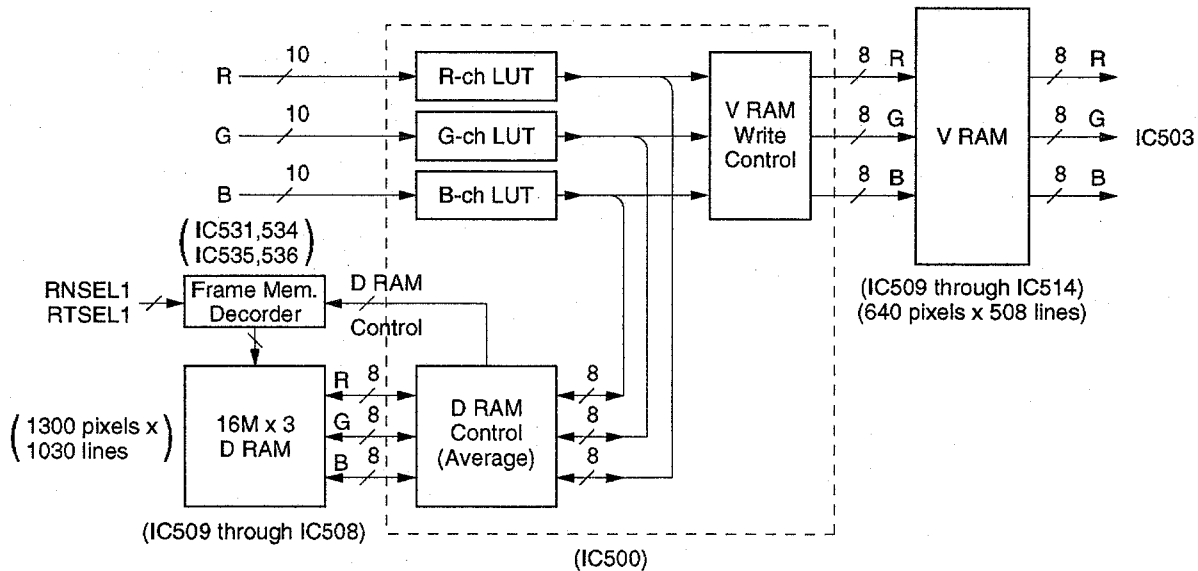


Fig. 4-2 Flow of Image Data during Memory Image Display and Capture

The CCD read mode of the camera head is put into the entire pixel read state to transfer only one frame when the release key on the remote control unit is pressed. When RT SEL0 to 3 signals are set to 1 (refer to page 4-6) at that time, the entire pixel data is sent from the ADR0 through 9, ADG0 through 9, and ADB0 through 9 input pins to IC500 and passed through R-, G-, and B-channel lookup tables. In synchronization with WEN, XHD ($\overline{\text{WHD}}$), and ADCK (20 MHz clock) signals, the pixel data is then written in IC506 (R channel), IC507 (G channel), and IC508 (B channel) in the high-speed page mode. The RNSSEL0 through 3 and RTSEL0 through 3 data that latch the DRAM control signals, output from IC500, (XRTC (set low during image memory capture or clear operation), XRFC (set low during image memory refresh), $\overline{\text{RAS}}$, $\overline{\text{CAS}}$, $\overline{\text{OE}}$, $\overline{\text{WER}}$, $\overline{\text{WEG}}$, $\overline{\text{WEB}}$, and DIR (determines the data bus direction of image memory)) by IC529 and IC530 are decoded (by IC531 and IC532). Moreover, RNSSEL1 and RTSEL1 signals are generated, and the DRAM control signal described above is decoded by the RNSSEL1 and RTSEL1 signals. As a result, image memory consisting of IC506, IC507, and IC508 is controlled (by a frame memory decoder consisting of IC531, IC534, IC535, and IC536 shown in Fig. 4-2). During write operation, the RTSEL1 signal is set to 0, and the RNSSEL1 signal to 1 (the RNSSEL1 and RTSEL1 signals are set to 1, respectively during normal operation). The size of the written image is 1300 pixels x 1030 lines.

The memory image display is described next.

For review during capture operation, the entire pixel data from the camera head is decimated as shown in Fig. 4-3 and written (alternately for every odd and even line of VRAM) in VRAM simultaneously with when it is written in image memory consisting of IC506, IC507, and IC508.

When the live/memory key on the remote control unit is pressed and memory 1 is selected, RNSEL0 through 3 signals are set to 1 (refer to page 4-5) and the RNSEL1 signal shown in Fig. 4-2 is set low (the RTSEL1 signal is set high). At that time, the image data (with image size of 1280 pixels x 1016 lines) of IC506 through IC508 are read and input to IC500. In IC500, 2 x 2 pixel data items are equalized as shown in Fig. 4-4 and alternately written in VRAM for every odd and even memory line.

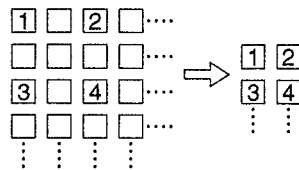


Fig. 4-3 Decimated Data during Review

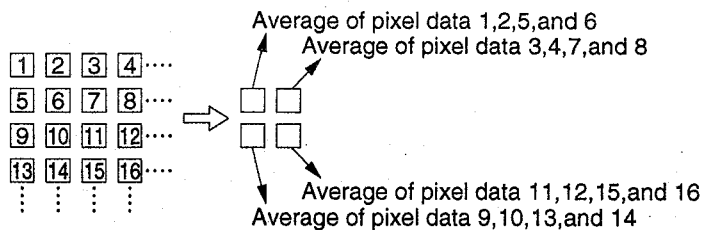


Fig. 4-4 Average Data during Memory Image Display

(3) DMA data transfer

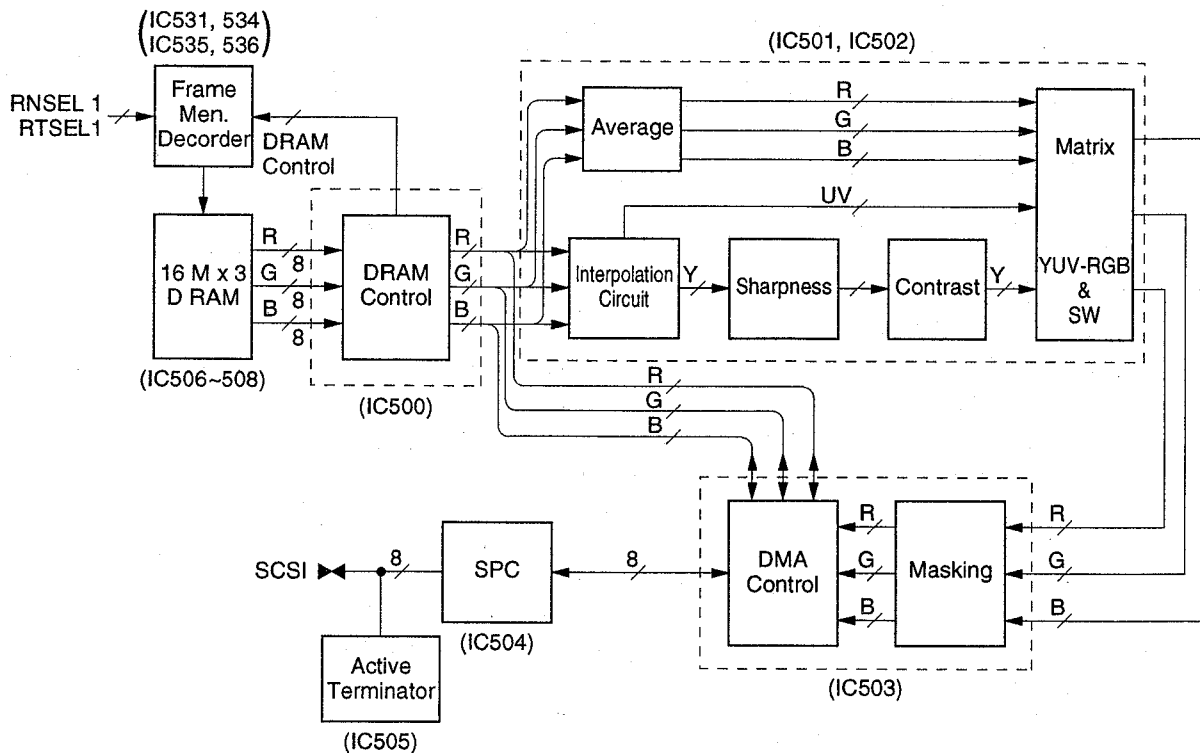


Fig. 4-5 Flow of Image Data during DMA

1) Full image transfer (2560 pixels x 2048 lines x R.G.B)

Nine image memories (including the eight image memories on the ADA-52 board) are provided. **RTSEL0** through 3 signals are set to 1 (refer to page 4-6) when the image memory on the SY-243 board is selected. DRAM control signals (**XRFC**, **XRTC**, **RAS**, **CAS**, **OE**, **WER**, **WEG**, **WEB**, and **DIR**) are decoded using a frame memory decoder consisting of IC531, IC534, IC535, and IC536 so as to select and control IC506, IC507, and IC508. The **R**, **G**, and **B** data (1300 pixels x 1030 lines) of image memory 1 are passed through IC500 and transferred in the handshaking (asynchronous) state by IC501, **REQ** and **ACK** signals. The eight-bit **R**, **G**, and **B** image data items input to IC501 are first interpolated in IC501. In the camera head, the **R**, **G**, and **B** CCDs are fixed with the **R** and **B** channels obliquely shifted for a **G** channel by a half pixel.

By interpolating the eight-bit R, G, and B image data, however, the image size is made double in the vertical and horizontal directions from 1300 pixels x 1030 lines to 2600 pixels x 2060 lines. As a result, the resolution is improved (1400 TV lines).

For the interpolation block processing in Fig. 4-5, the R, G, and B signals are converted into luminance signal Y and color-difference signals (R-Y) and (B-Y) so as to interpolate the Y signal. The interpolated Y signal is processed in sharpness and contrast blocks, converted into R, G, and B signals, and output from IC501.

To avoid the influence of FIR filter in IC501, the image is cut in the upper and lower, and right and left portions. The size of the obtained image is 2580 x 2056. The sharpness and contrast blocks have parameters that enable control operation. (In the menu, the sharpness can be set in the range of off, low, mid, and high, and the contrast can be selected in the range of -5 to +5.)

The R, G, and B image data output from IC501 are transferred for IC503 in the handshaking and asynchronous states by REQ and ACK signals and input to IC503. In IC503, masking (in which hue, saturation, and brightness can be adjusted) is performed. The masking block has parameters that enable control operation (in the menu, the masking can be selected in the range of off, low, mid, and high). The R, G, and B output signals are converted into R, G, and B point-sequential data by a DMA control block and transferred in the handshaking and asynchronous states between the DAM control block and SPC (IC504) by REQ and ACK signals. Moreover, R, G, and B point-sequential image data items (2560 pixels x 2048 lines) are transferred from IC504 to the computer between a processor and computer via an SCSI bus.

In IC503, 2560 pixels x 2048 lines are clipped from the image size of 2580 x 2056 for data transfer.

2) Index image transfer (320 pixels x 256 lines x R.G.B)

The index image transfer is basically the same as a full image transfer except that, in IC501, an index image is output through an average circuit. For 320 pixels x 256 lines, the average data of 16 pixels in all (4 pixels each in the horizontal and vertical directions) is output by one pixel. The image size is 1280 pixels x 1024 lines in the output block of IC500, 320 pixels x 256 lines in the output block of IC501, and 320 pixels x 256 lines in the output block of IC503. In other words, the clip operation that is performed in IC501 and IC503 during full image transfer is not carried out during index image transfer. No sharpness and contrast processing are also performed.

3) Raw image transfer (1300 pixels x 1030 lines x R.G.B)

During raw image transfer, the raw image captured by image memory is directly output to SCSI without sharpness, contrast, and masking processing.

The raw image skips IC500 to IC501 (IC502) as a pass and is directly transferred to IC503. In the same way as described previously, it is transferred in the handshaking and asynchronous states by REQ and ACK signals. Both read and write operations are performed only during raw image transfer, that is, the raw image is transferred in two ways.

For the asynchronous handshaking transfer using REQ and ACK signals, the REQ signal is output from the data transmission side, and the ACK signal is output from the data reception side. However, between IC504 and IC503, the REQ signal is output from IC504, and the ACK signal is output from IC503.

[5] CIRCUIT DESCRIPTION OF ADA-52

(1) Outline

The ADA-52 board mainly consists of an A/D block, D/A block, memory block, and PLL block.

The A/D block is constituted by a floating video amplifier circuit, cable compensation amplifier circuit, bias amplifier (CXA1399), DC level shift circuit, and A/D converter (SPT7855).

The D/A block is constituted by a D/A converter, low-pass filter, RGB encoder (CXA1645), video amplifier, and 75Ω driver.

The memory block is constituted by 16M-bit DRAM for eight image memories and a frame memory decoder.

The PLL block is constituted by a sync signal generator (CXD1159) that generates a timing pulse and clock (12.288461 MHz) for monitor display, phase comparator (TC8051), TL082 for a low-pass filter amplifier, and voltage-controlled crystal oscillator (VCO)(24.576 MHz).

(2) A/D block

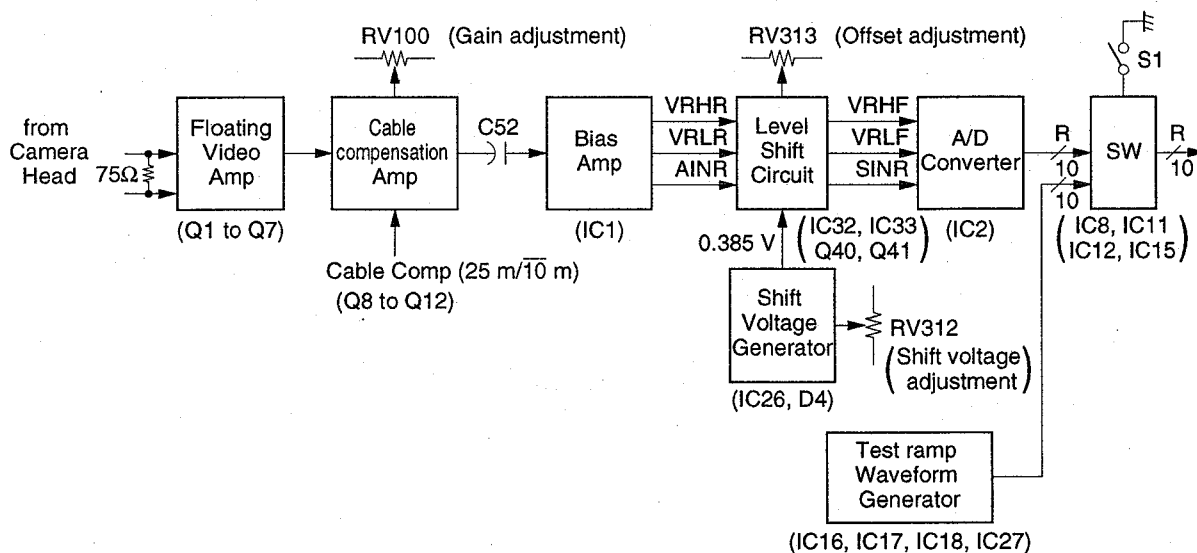


Fig. 4-6 Block Diagram of A/D Block

The A/D block is described based on an R-channel circuit below. (G- and B-channel circuits are the same as for the R-channel circuit.)

The video amplifier in the initial stage has a floating structure so as to cancel the potential difference of ground (GND) from a signal line and cancel the in-phase noise between the signal line and GND when a potential difference occurs between the camera head of DKC-ST5 and the processor.

The cable compensation amplifier in the second stage contains a low-pass filter in the feedback block. The attenuation occurring when the camera cable between the camera head and processor is 10 m or 25 m is compensated so that it is flat in the input block of a bias amplifier (IC1) by switching the effect of the low-pass filter using FET (Q12).

The level of a signal input to the A/D bias amplifier (IC1) is also gain-adjusted by RV100. Bias amplifier IC1 samples and holds a signal, amplifies a signal to about three times as high, and generates a reference voltage for an A/D converter.

To match the DC characteristics of the reference voltage between the bias amplifier (IC1) output and A/D converter (IC1) input, the level shift circuit and shift voltage generator generate a voltage of 0.385 V (adjusted by RV312), decrease the DC voltage level by 0.385 V, and input the voltage to the A/D converter.

Moreover, offset adjustment is performed for the DC level fine-adjustment of a signal by RV313.

A ramp waveform generator is mounted for adjustment on the ADA-52 board. The image signal from the A/D converter and the test ramp waveform can be switched using switch S1 on the front end of the board.

A 10-bit sampling signal of 20 MHz is output from the A/D converter.

(3) D/A block

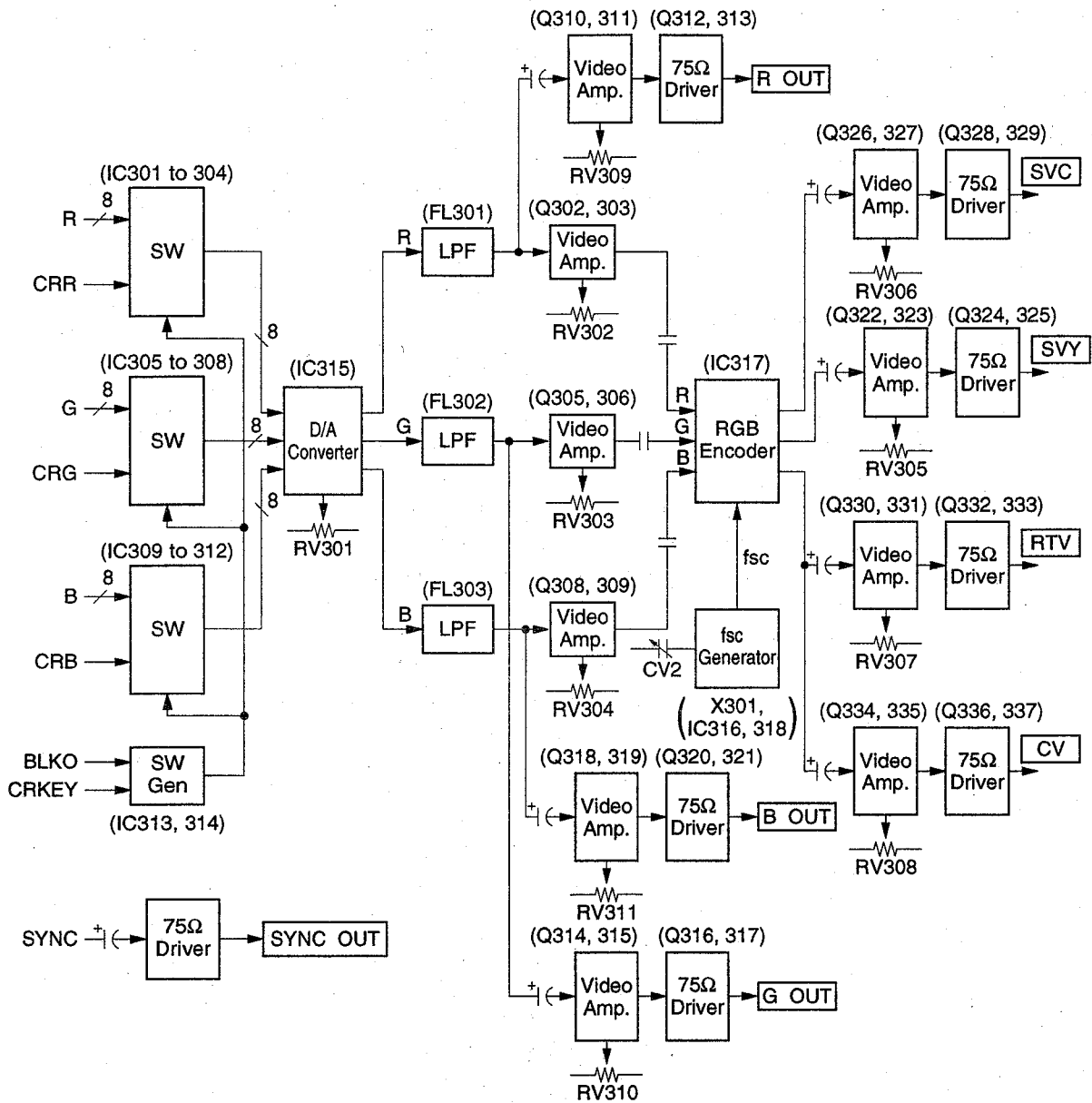


Fig. 4-7 Block Diagram of D/A Block

The D/A block is described next.

The eight-bit R, G, and B signals on the left of Fig. 4-7 are the display image data (live and memory images) from the SY-243 board. CRR, CRG, and CRB are one-bit data for menu display (e.g., character display). BLKO is a blanking signal indicating whether it is a video period. CRKEY is a character signal indicating whether character data exists. In the switch generation block, the switch block is controlled, and the CRR, CRG, and CRB signals are selected when the BLKO and CRKEY are used. When BLKO and CRKEY signals are used, R, G, and B signals are selected and input to the D/A converter. RV301 is used to adjust the maximum amplitude value of a D/A output signal. The resultant signal is converted from digital to analog using the D/A converter. The converted analog R, G, and B signals are input to low-pass filters FL301, FL302, and FL303 to eliminate the reflected components. The cut-off frequency is 6 MHz.

The output signal of the low-pass filters is cut in a DC component and output through a video amplifier and 75 Ω driver to the RGB monitor. For a SYNC OUT signal, the composite sync signal generated in the PLL block is cut in a DC component, and the resultant signal is output through a 75 Ω driver. RV309, RV310, and RV311 are used to adjust the gains of R, G, and B output signals.

Moreover, the output signal of the low-pass filters is passed through a video amplifier, cut in a DC component, and input to RGB encoder IC317. RV302, RV303, and RV304 are used to adjust the gains of the R, G and B signals that are input to the RGB encoder.

RGB encoder IC317 generates and inputs a subcarrier of 3.579545 MHz using an fsc generator. The fsc frequency is adjusted using trimmer capacitor CV2. An S-video Y signal, C signal, and composite video signal are then output as an output signal of the RGB encoder. Each signal is output as a monitor signal of the S-video Y signal, C signal, and composite video signal and a return video signal to the camera head through a video amplifier and 75 Ω driver. RV305, RV306, RV307, and RV308 are used to adjust the gains of S-video Y, S-video C, return video, and composite video signals.

(4) Memory block

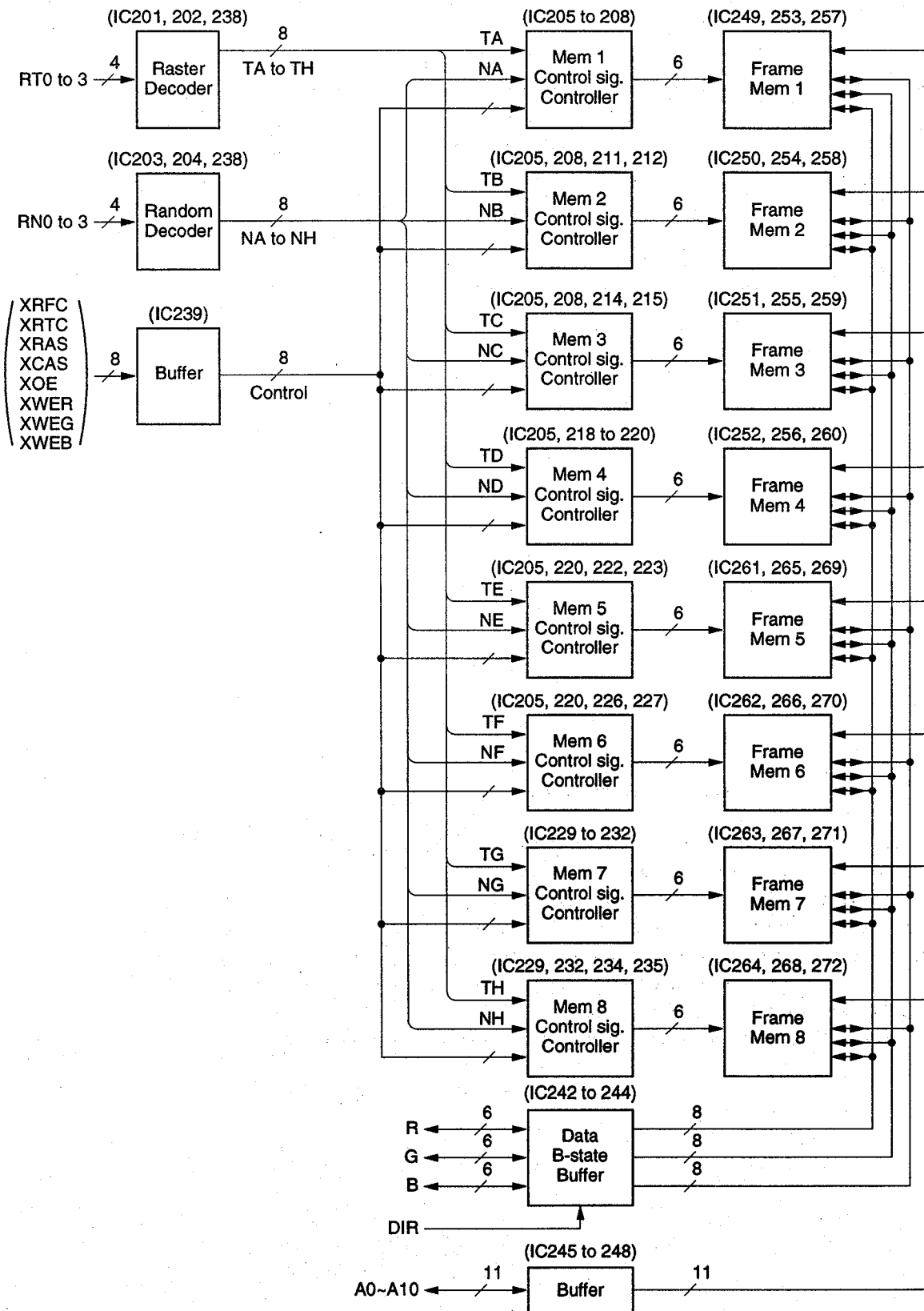


Fig. 4-8 Block Diagram of Memory Block

The memory block is described based on Fig. 4-8.

The memory block uses three 16M-bit DRAMs (R, G, and B) and constitutes eight frame memories.

The RT0 through 3 signals on the left of Fig. 4-8 are used to select the type of memory in which the image signal from the camera head is memorized. RN0 through 3 signals are used to select the type of memory to be displayed, the contents of memory to be transferred to a computer, and the type of memory in which image data is written from a computer.

The actual memory selection is shown in the table below.

RN3 RT3	RN2 RT2	RN1 RT1	RN0 RT0	Description
0	0	0	0	stand-by
0	0	0	1	SY-243 Memory
0	0	1	0	Frame Mem. 1
0	0	1	1	Frame Mem. 2
0	1	0	0	Frame Mem. 3
0	1	0	1	Frame Mem. 4
0	1	1	0	Frame Mem. 5
0	1	1	1	Frame Mem. 6
1	0	0	0	Frame Mem. 7
1	0	0	1	Frame Mem. 8
1	0	1	0	NOP
1	1	1	1	

Table 4-4 Memory Selection

RT0 through 3 and RN0 through 3 signals are decoded by a raster decoder and random decoder and input to memory 1 through 8 control signal controllers, respectively. XRFC, XRTC, XRAS, XCAS, XOE, XWER, XWEG, and XWEB signals are passed through a buffer as memory control signal and input to the memory 1 through 8 control signal controllers described above. In the eight controller blocks, frame memory 1 through 8 control signals (XRAS, XCAS, XOE, XWER, XWEG, and XWEB) are generated by the output signals of the above two decoders, and XRFC and XRTC signals and input to each memory.

The data bus and address bus are used in common for frame memories 1 through 8.

(5) PLL block

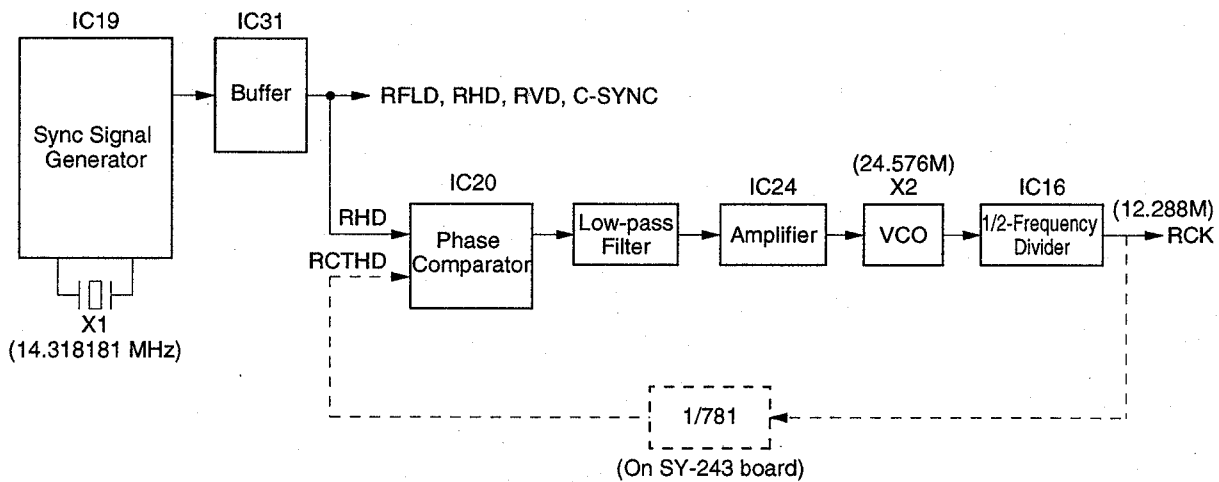


Fig. 4-9 Block Diagram of PLL Block

In the PLL block, the aspect ratio on the monitor is 4 to 3 because the CCD has a square grid. Therefore, the image size is 486 lines in the vertical direction and 648 pixels in the horizontal direction. The PLL block generates an RCK clock (12.288 MHz) that samples the video period of an NTSC signal by 648.

The RFLD, RHD, RVD, and C-sync signals generated using sync signal generator IC19 are passed through buffer IC31 to produce a sync signal for display.

The RCT HD signal generated when an RCK clock is frequency-divided by 781 and the output RHD signal of sync signal generator IC19 is phase-compared using phase comparator IC20 to generate an RCK clock (12.288 MHz). The obtained error signal is passed through a low-pass filter consisting of C and R and input from amplifier IC24 to voltage-controlled oscillator (VCO) X2 (24.576 MHz). The output clock of the VCO is frequency-divided into 1/2 by IC16 to produce an RCK clock of 12.288 MHz. The frequency division of 1/781 is performed on the SY-243 board.

4-2. Camera Section

[1] Description of the imager

The DKC-ST5 uses the 2/3 inch CCD imager ICX085-FL2 that has 1,400,000 pixels.

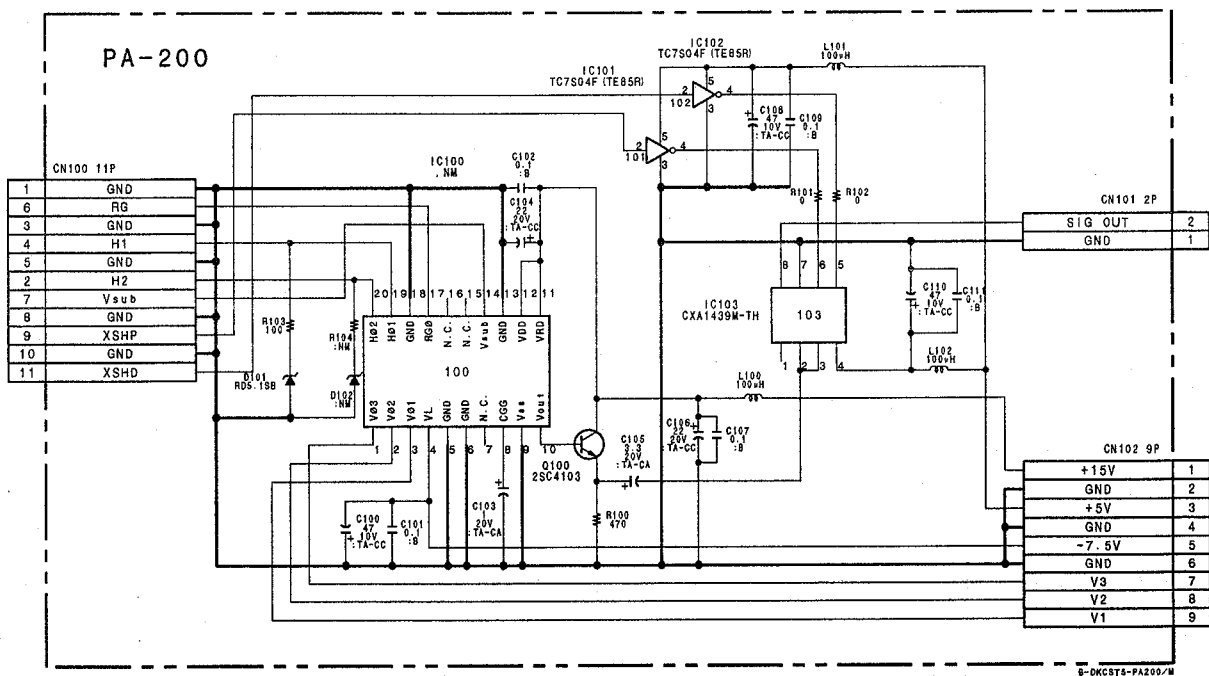
- Picture element 1280×1024
- When taking the still image, entire pixels are read out independently.
(Frame frequency 12Hz, This following indication is entire pixel reading out.)
- The line numbers are decreased to 1/2 by 2 lines addition reading out in live picture mode.
The reading out time is decreased to 1/2 time.(frame frequency is 24Hz, This following indication is twice normal speed reading out.)
- Electronic shutter
- Square grid unit cell

In live image, the video signal reading from CCD imager with frame frequency 24Hz is sent to the processor, and in the processor, the signal is converted analog to digital, and is sent to the memory once. The signal reading from the memory with the frame frequency 30Hz is produced the video signal with NTSC timing equivalent. It is sent to the MONITOR terminal.

[2] PA-200,PA-201 and PA-202 Board

PA board is for attaching to the CCD imager. Power supply to CCD and supply of driving pulse are performed. CDS(CORRELATED DOUBLE SAMPLING) is composed. PA-200, PA-201 and PA-202 boards are same circuit composition. Therefore, PA-200 is only explained.

The driving pulse (H1, H2, RG, V1, V2, V3) and V sub supplied from TG-180 board are sent to CCD imager IC100. The video signal from pin 10 of IC100 is passed through Q100 and inputted to pins 2, 3 of IC103. IC103 is the CDS circuit. Pulse for CDS is supplied from TG-180 board as XSHP and XSHD. They passed through inverter IC101 and IC102 respectively and inputted to IC103. The video signal outputted from pin 8 of IC103 is sent to the PR-228 board.



[3] PR-228 Board

R, G and B signals from PA-200 (B) / 201 (G) / 202 (R) are inputted to the PR-228 board and passed through the 20MHz trap circuit. They are entered to the video amplifier (IC102, 202, 302). The following processes are performed at this amplifier.

- White shading
- Gain control
- Blanking clean
- White balance
- Pre knee

After that, The signals are passed through the gamma correction circuit, knee circuit and drive circuit, and inputted to the processor via MB-724 board.

R-ch, G-ch and B-ch are the same circuit composition. Therefore, R-ch is explained as an example.

(1) Video amplifier from trap filter

The signal passed through CDS circuit on the PR board is inputted to the PR-228 board. This signal (CN101-2) includes CCD driving pulse of 20MHz and coupling noise of sample hold. This signal is passed through 20 MHz trap filter (FL101) to prevent bad condition at the following signal process circuit. After this signal is passed through buffer Q103 and is adjusted the level by RV103. After that, it is inputted to pin 18 of VA IC (IC102 : CXA1486Q). The serial data from microcomputer on the AT-115 board are passed through pin 20 (SCK), pin 18 (S DATA) and pin 16 (LD1) of CN1 and inputted to the D/A converter IC105. The analog signal outputted from the IC105 controls the all sections on the PR-228 board. This control voltage becomes approx. 2.3 V when the data from AT-115 board is 80H, approx. 4.6 V as maximum when the data is FFH, and 0V as minimum when the data is 00H.

(2) Video amplifier

Video amplifier IC (IC102) is explained. IC102 is composed following circuit.

- Black set
- Clamp
- Video amplifier gain switching circuit
- Blanking clean
- White balance circuit
- Pre knee correction
- Shading correction

[Black set]

The black level is decided by optical black level as standard. In case there is the difference between black levels video and optical on the video amplifier gain switching circuit, the black level is fluctuated by switching the gain and the black level component may be added a color. Therefore, the black set signal is added to main line at VA IC (IC102) input. This black set signal cancels the difference. This black set correction signal is made as following. The DARK control signal of pin 6 of IC105 is divided the voltage by R149 and R133. DARK control signal is 2.3 V by standard. R133 becomes approximately 0 V to divide the voltage since it is connected to -2.5 V. The signal is cleaned the GND level by BLK phase at IC103 (1/3). This signal is attenuated by R110 and R111 and inputted to BLACK SHADING control terminal.

When switching the gain, black level change is canceled by adjusting the DARK output with control data from AT-115 board. This adjustment is performed on adjustment mode. In ABB operation mode, The microcomputer on the AT-115 board automatically adjusts it. The OFF-SET of optical black level and blanking level are loosen by adjusting pin 5 (BLACK1) of IC105 on the adjustment mode.

[Clamp]

The signal is clamped to stabilize the DC voltage of video waveform.

[Video amplifier gain switching circuit]

It is available to set the gain from -3 dB to 30 dB as IC. In DKC-ST5, the gain setting is used from 6 dB to 30 dB in LIVE mode according to level diagram and dynamic range. And in STILL mode, 6 dB/12 dB/18 dB/24 dB are used as ISO20/40/80/160 equivalent. The gain is selected by controlling the voltages of pin 19 (GS2) and pin 20 (GS1) with pin 9 (GS1) and pin 12 (GS2) of IC105 output.

The gain is decided by selecting three values(0 V, 2.3 V, 4.6 V) combination.

		GS1		
		4.6 V	2.3 V	0V
GS2	4.6 V	18 dB	-3 dB	24 dB
	2.3 V	12 dB	3 dB	30 dB
	0 V	0 dB	6 dB	9 dB

[BLANKING clean]

The black level of video signal is fixed at GND level in the blanking period. Like this, blanking cleaning is performed. In this stage, pre-blanking is performed by P BLK pulse.

[White balance circuit]

The output level of IC102 is pin 26 (G-CTRL) input voltage. This is variable approximately more than ± 6 dB continuously. The microcomputer on the AT-115 board controls the output level of IC102. The white balance is adjusted by losing white level difference between G-ch and R-ch, B-ch.

[Pre knee correction]

Pre knee is that the signal is decreased the amplifier gain in more than some level, is compressed and is limited the maximum amplitude to coincide the signal for dynamic range of signal process circuit on rear stage. KNEE-PT control signal of pin 2 output of IC105 is passed through R147, attenuated at R122 and inputted to pin 9 (KNEE-PT) of IC102. Pin 2 output (KNEE-PT) of IC205 is master KNEE point adjustment signal. It is passed through R252 and controls the IC102.

[Shading correction]

The shading may be appeared by the optical system and image pick up devices. In the DKC-ST5, it is performed to correct the white shading. The amplitude and polarity of H SAW signal output of IC103 (3/4) are controlled by the pin 3 (H SAW) output of IC105. The amplitude and polarity of V SAW signal output of IC103 (4/4) are controlled by pin 4 (V SAW) output of IC105. These two signals are mixed at R140 and R141, and is preblanking cleaned at IC101 (2/3) and is inputted to the white shading correction input terminal (pin 2 of IC102). The output of IC102 is controlled the gain by this saw tooth waveform. As a result, white shading is corrected.

Saw tooth waveform appearance of R-ch H SAW is explained as an example.

The H SAW control signal is divided the voltage by R134 and R136, and inputted to the pin 5 of IC103. When pin 9 of IC104 (2/3) is turned ON by CLP2, IC103 becomes voltage follower. Therefore, the pin 7 is the same output as pin 5.

The IC103 is operational amplifier. The pin 5 and pin 6 are the same voltage since input of positive and negative are imaginary shorted. The difference voltage between the pin 5 and H SAW control signal is applied to the R135. And the respond current flows. This current flows between pin 6 and pin 7 as it is since input impedance of pin 6 is infinity. When CLP2 becomes L, pins 3 and 4 of IC104 becomes open, C126 is started to charge by the above current. The charging current is decided by H SAW control voltage. Therefore, the voltage is fixed and voltage change by time is also fixed. The signal that voltage is increased or decreased by fixed ratio is outputted from pin 7. This is the saw tooth waveform. The amplitude and polarity of H SAW waveform is controlled by changing H SAW control voltage since the current is changed by applied voltage to R135.

The V SAW control voltage is switched by the reading out the signal since V period is changed by whether entire pixel reading out or twice normal speed reading out of CCD reading.

(3) Gamma correction circuit

The video signal outputted from pin 7 of IC102 is adjusted the level by RV401, and is passed through Q401 buffer and the amplifier Q402 through Q404. That output is inputted to gamma amplifier input, the base of Q409. It is attached to load resistor R452 and diode D401 to the collector of Q411. D401 has four diodes. Their cathodes are connected to the voltages which are divided by R456, R461, R458, R455, R454 and RV404 through R453, R457, R460, R463. When signal is nothing, the diode is OFF since the cathode voltage of D401 is low. Therefore, the signal is not passed. When the signal is gradually bigger, the diode is conducted from lower voltage one gradually and the signal is outputted. This signal is negative fed-back to Q412 via RV405. When the signal becomes bigger, the quantity of feed-back through the diode become bigger. Therefore, the output gain becomes smaller than signal becomes bigger. The collector signal of Q411 is entered to base of Q413, is attenuated at R467, R465 and R466, is passed through RV405 and is negative fed-back to Q412. The Q413 gamma amplifier output is sample-held by Q414 in the CLP2 period and is fed-back by the operation amplifier IC402 to the emitter of Q410. The voltage of RV406 (R PED) is passed through the voltage follower of IC402 (1/2) to become low impedance. And is entered to minus input of pin 2 of IC402. R PED control signal of pin 8 of IC105 and the master PED control signal of pin 8 of IC205 are mixed at R472, R477 and R478 and entered to the minus input of pin 2 of IC402. The feedback works to coincide this mixed voltage and the voltage of black level that is sample-held by pin 3 of IC402. As a result, the black level is fixed by gamma circuit. Stabilization of gamma process is planned.

(4) Knee

Gamma correction circuit output of Q413 is passed through the buffer Q415 (1/2). This voltage is compared with the voltage that is set by RV407 at Q415 (1/2 and 2/2). When the signal is bigger than setting voltage, Q415 (2/2) becomes ON, the signal is attenuated at R496 and R497. By this mean, the signal of over setting voltage can be attenuated. After that, this signal is passed through buffer Q416, sent to AT-115 board via MB-724 board. And the other side, the signal is sent to 75 Ω driver circuit.

(5) 75 Ω driver circuit

The signal from Q416 emitter is passed through C422, and the buffer Q419 (1/2 and 2/2), entered to base of Q420 (1/2). The output from that collector is sent to the driver circuit that is composed by Q421 through Q424. The output of this driver circuit is fed-back to the base of Q420 (2/2). The output of driver circuit is sent to the MB-724 board and passed through 75 Ω resistor, is sent to the processor.

[4] TG-180

TG-180 includes following circuits.

- Timing generator (TG) (IC5 : CXD2437TQ)
- Sync generator (SG) (IC101 : CXD8843R)
- H driver (IC2 / 3 / 6 / 7 / 10 / 11 : 74AC04SJ)
- V driver (IC4 / 8 / 12 μ PD16502GS)
- High speed electronic shutter pulse generation (IC9 : μ PD16502GS)
- V sub generation
- RG clamp

(1) Timing generator

IC5 (CXD2437TQ) is timing generator (TG) that is developed for CCD imager ICX085. The oscillator is CP1. 40MHz clock is inputted to pin 64 (CKI) of IC5. Some kind of pulses are generated by the clock and HD and VD that are generated by SG. 1/2 frequency divided clock of the oscillator is outputted to pin 51 (CL) and is supplied to SG. Setting of the electronic shutter is performed by serial signals (SDATA, SCLCK, STRBTG) outputted from the microcomputer on the AT-115 board. When the still image is taking, the start timing of reading out is decided by TRIG signal output from the microcomputer on the AT-115 board. The entire pixel reading out or twice normal speed reading out is switched by RM signal outputted from the microcomputer on the AT-115 board. (RM= "H" -Entire pixel reading, RM= "L" -twice normal speed reading out.)

(2) Sync generator

The IC101 (CXD8843R) is programmable SG. The timing of some kinds of pulses outputted from this SG are decided by serial signals (SDATA, SCK, STBSG) with the microcomputer on the AT-115 board. This IC is operated as twice normal speed reading out equivalent. The VD (pin 37 of IC101) is sent to IC104 (SN74HC00), when twice normal speed reading out, as it is, when entire pixel reading out, is masked by 1/2 and is outputted. This signal is sent to TG as VD. The VD of twice normal speed reading out is sent to the AT-115 board and the processor via MB-724 board as communication timing between camera and the processor. The output of pin35 (V WINDOW) and pin 36 (H WINDOW) of IC101 are composed at IC102. The WINDOW pulse is made. This pulse indicates center section of screen. This signal is sent to the AT-115 board via MB-724 board. This signal is used for exposure detection when operating auto white balance and METERING is PEAK setting.

(3) H driver

The output of pin 25 (XH1) of IC5 is sent to IC3 / 7 / 11 (74AC04SJ). The output of pin 26 (XH2) of IC5 is sent to IC2 / 6 / 10. ICs that are signals sent is H driver. These ICs includes 6 inverters. The large current drive can be controlled by three ICs of them are connected in parallel. The one of these ICs are connected to the H1 or H2 of one of CCD imagers. The output of IC2 / 3 is sent to the PA-202 board, The output of IC6 / 7 is sent to the PA-201 board and the output of IC10 / 11 is sent to the PA-200 board.

(4) V driver

The outputs of pin 23 (XV1), pin 22 (XV2), pin 21 (XV3) and pin 18 (XSG) are sent to the IC4 / 8 / 12 (uPD16502GS). The IC4 / 8 / 12 are V driver. This IC generates V1 (value 2) from XV1, V2 (value 3) from XV2 and XSG and V3 (value 3) from XV3 and XSG. The signal of value 2 is -7.5 V / 0 V and the signal of value 3 is -7.5 V / 0 V / 15 V.

The output of IC4 is sent to the PA-202 board, the output of IC8 is sent to the PA-201 board and the output of IC12 is sent to the PA-200 board.

(5) High speed electronic shutter pulse generating

Pin 19 (XSUB) of IC5 outputs the electric charge cleaning pulse for CCD imager. High speed electronic shutter of 1 / 24 seconds or less at twice speed reading out, and 1 / 12 seconds or less at all pixels reading out is realized by setting the output period of cleaning pulse in the 1V. This signal is sent to the IC9 and converted -7.5 V / 15 V pulse (22.5 V at peak to peak). The pin 18 of IC9 is that output. That lower side is clamped at 15 V by C49 and D3. Those signals are added to each V sub via C8, C35 and C59.

(6) V sub generation

Board voltage of CCD imager is decided by each imager. R ch circuit is explained as an example. The setting voltage by RV4 is inputted to the base of Q2. Q2 is differential amplifier. The opposite side of the base becomes the same voltage. The voltage of TP3 is $(R9+R10) / R10$ times of the previous voltage since the base current is minuteness. This voltage is sent to the CCD imager board. As described before, the electronic shutter pulse is also added via C8.

(7) RG clamp

The signals outputted from pin 27 (RG) of IC5 are passed through each clamp capacitor C2, C29 and C53 and lower clamped. They are sent to the CCD imagers.

5. MB-724 board

MB-724 board connects between each circuit boards as mother board.

Other circuits are receiving return video signal from processor and the driver circuit. RET VIDEO (pin 7 of CN209) is main signal. RETV GND (pin 8 of CN209) is GND. The RET VIDEO is sent to the emitter of Q203 via R203, R244 and C220. The RETV GND is sent to the base of Q203 via Q201. The frequency response compensation of connection cable is performed at this process. Q202 through Q207 are the feedback amplifier. The emitter output of Q207 is divided by two. One is inputted to IC201 via Q208 and Q209. The IC201 is 75 Ω driver of video signal. The output of pin 12 of IC201 is inputted to pin 4 of CN207 and is sent to the BNC connector via CN-1395 board as MONITOR output. Another is passed through Q210, Q211 and pin 1 of CN207 and inputted to the pin 8 of DIN connector via CN-1395 board as view finder output. This board composes DC-DC converter that supplies each converted voltages from processor +12 V power to each board.

[6] AT-115 board

AT-115 board is composed following circuits.

- One chip microcomputer
- Microcomputer reset circuit
- EEPROM
- Video signal detection circuit
- Lens control circuit for video camera
- Communication buffer with the processor
- Detection sensor for camera setting direction

(1) One chip microcomputer

IC10 is one chip microcomputer uPD78P218AGC. This microcomputer performs camera block control, communication with the computer of processor side, communication (control) with exclusive lens, control of lens for video camera and reading of remote controller switch mode.

(2) Microcomputer reset circuit

The IC8 (TL7705ACPS) resets microcomputer of IC10 when turning power on.

(3) EEPROM

IC12 (M6M80021) is EEPROM that stores each setting values of D/A converter on PR-228 board and the damage information of CCD imager. The damage information of CCD imager is sent to the processor, and when video data is transmitted, damage correction is performed.

(4) Video signal detection circuit

The Q1 through Q20, IC1 through IC6 and IC14 are video signal detection circuit. This circuit performs detection of white balance and black balance and brightness detection of live picture mode.

(5) Lens control circuit for video camera

IC11 (M62352GP) is D/A converter of 8 bit 12 ch. The microcomputer controls the iris of lens for video camera through this IC. This D/A converter outputs 0 V at 00 (hexadecimal), 5 V at FF(hexadecimal).

The iris value of lens is set by output of pin 18 of IC11. This signal is converted the level by IC7 and outputted to pin 48 of CN1. It is passed through the MB-724 board and CN-1462 board. It is sent to the lens. The servo of lens is switched by the output of pin 19 of IC11. This signal is driven by Q21 and Q22 and is sent to the lens in the same way above. The iris operation of lens is changed at REMOTE or LOCAL by switching output pin 2 of IC11 with two values 5 V / 0 V.

(6) Communication buffer with the processor

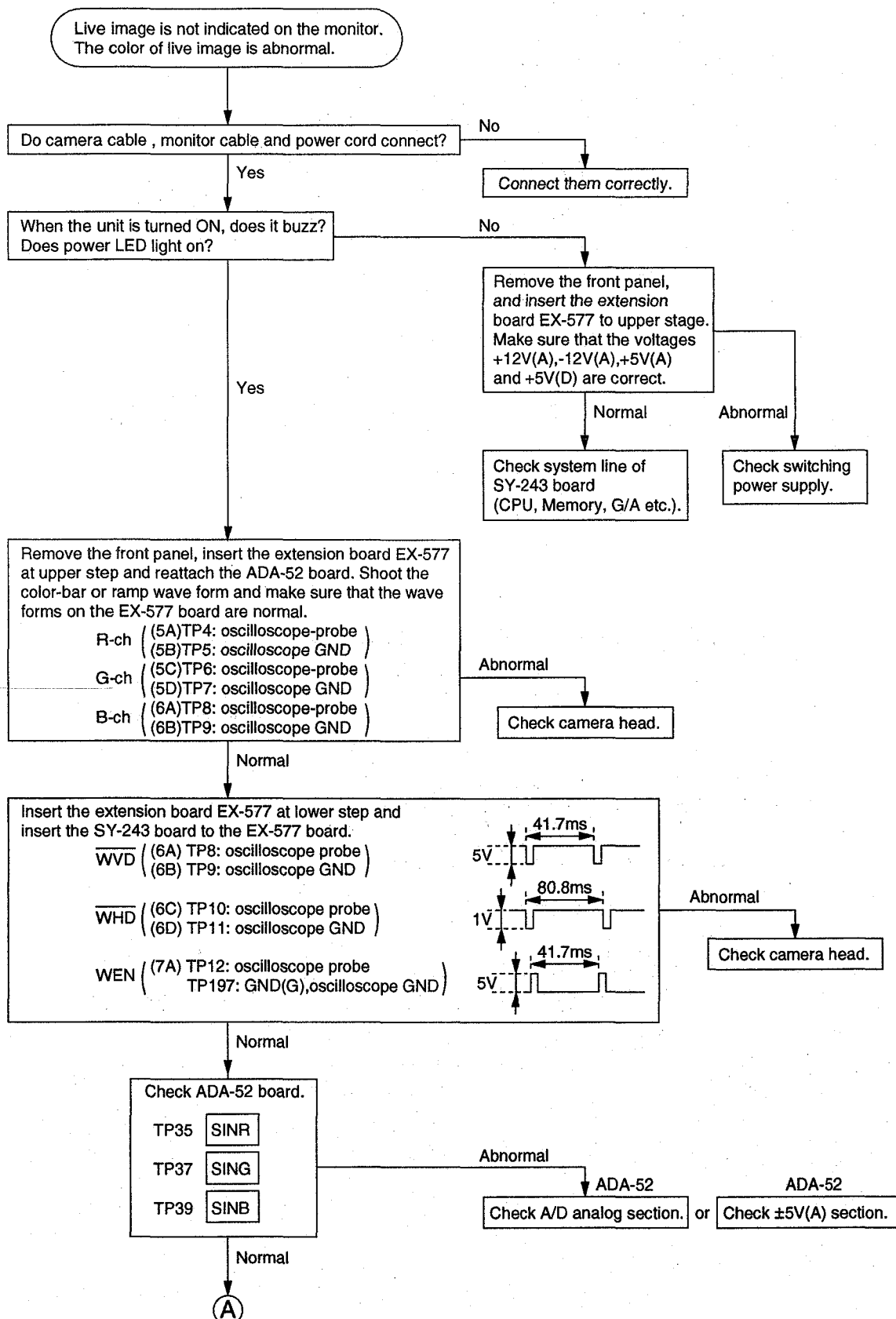
IC13 is the buffer between the processor and communication line. The output of pin 37 (TXD) is sent to the pin 3 of IC10, and converted the differential digital signal. It is outputted to pin 5 (TXD+) and pin 6 (TXD-) and sent to the processor via MB-724 board. Conversely, the differential digital signal at pin 8 (RXD+) and pin 7 (RXD-) of IC13 is converted to the digital signal 5 V / 0 V. It is sent from pin 2 of IC13 to pin 36 (RXD) of IC10.

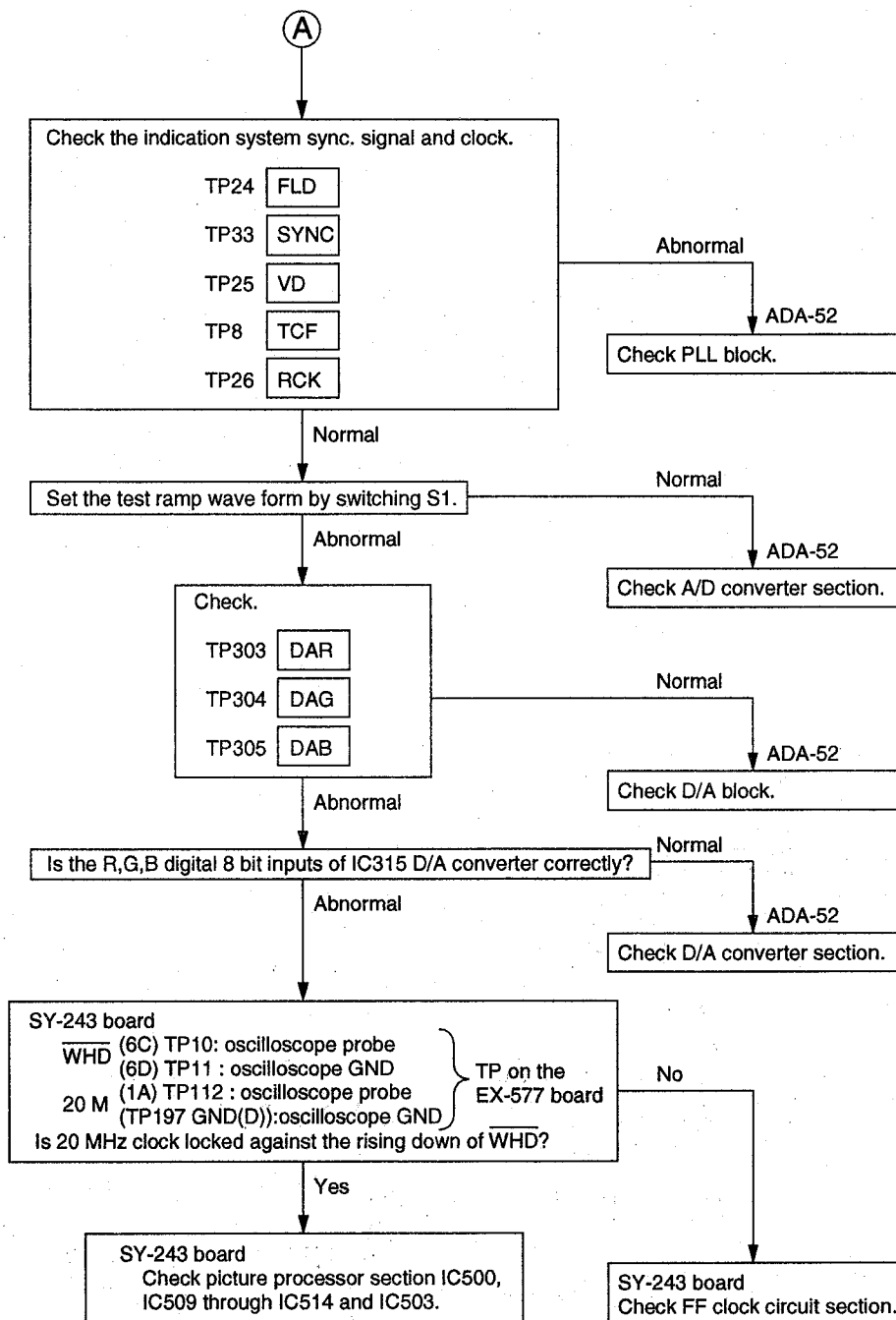
(7) Detection sensor for camera setting direction

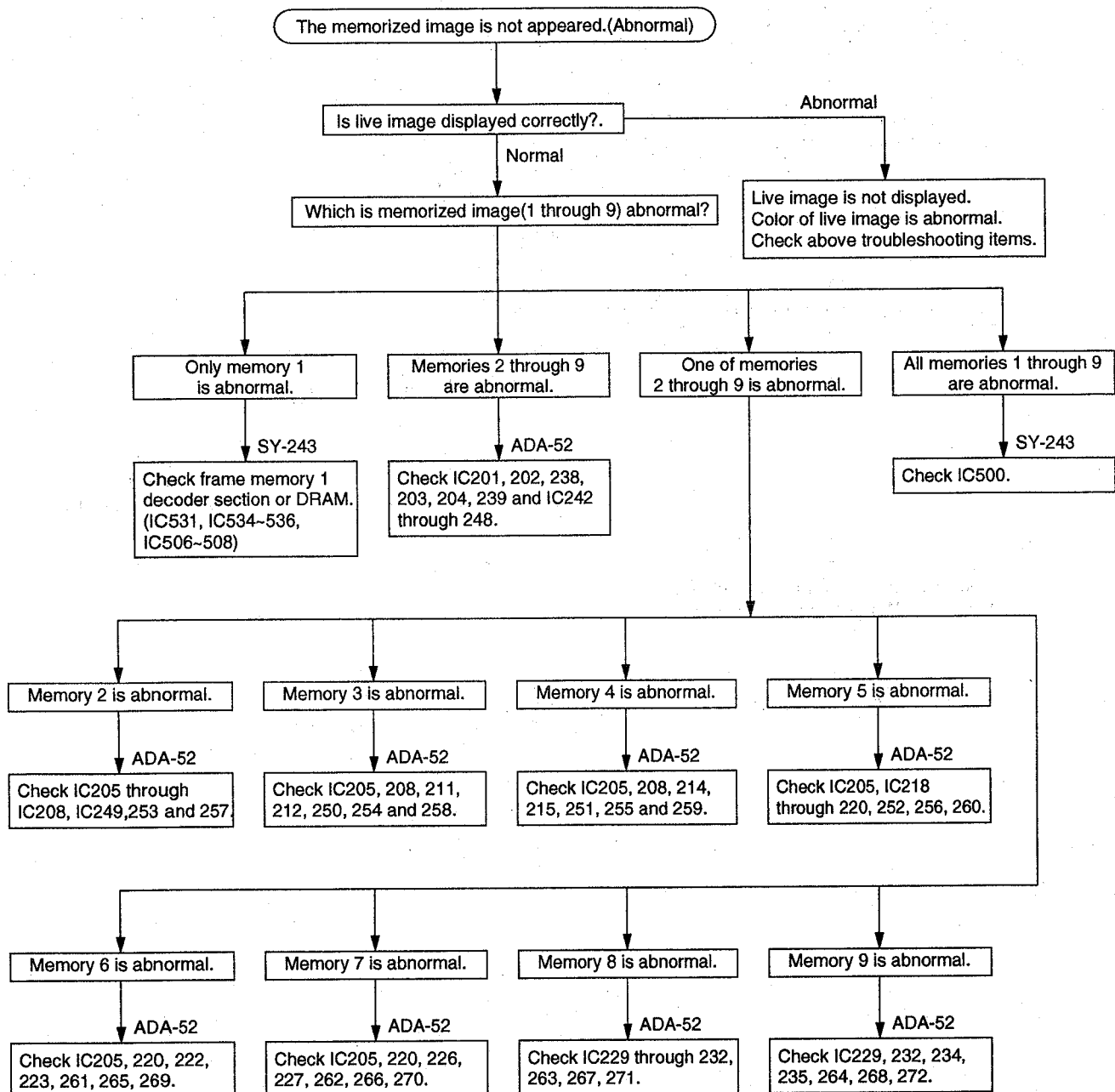
The SE1 (RIP-1020) detects setting direction of camera by slanting sensor. The pin 3 of SE1 is output. When regular setting, output is "L", when vertical setting, output is "H". This output is inputted to the computer pin 33 (TILT) of IC10. Its information is sent to the computer of the processor and decided the direction of character indicating on the picture screen.

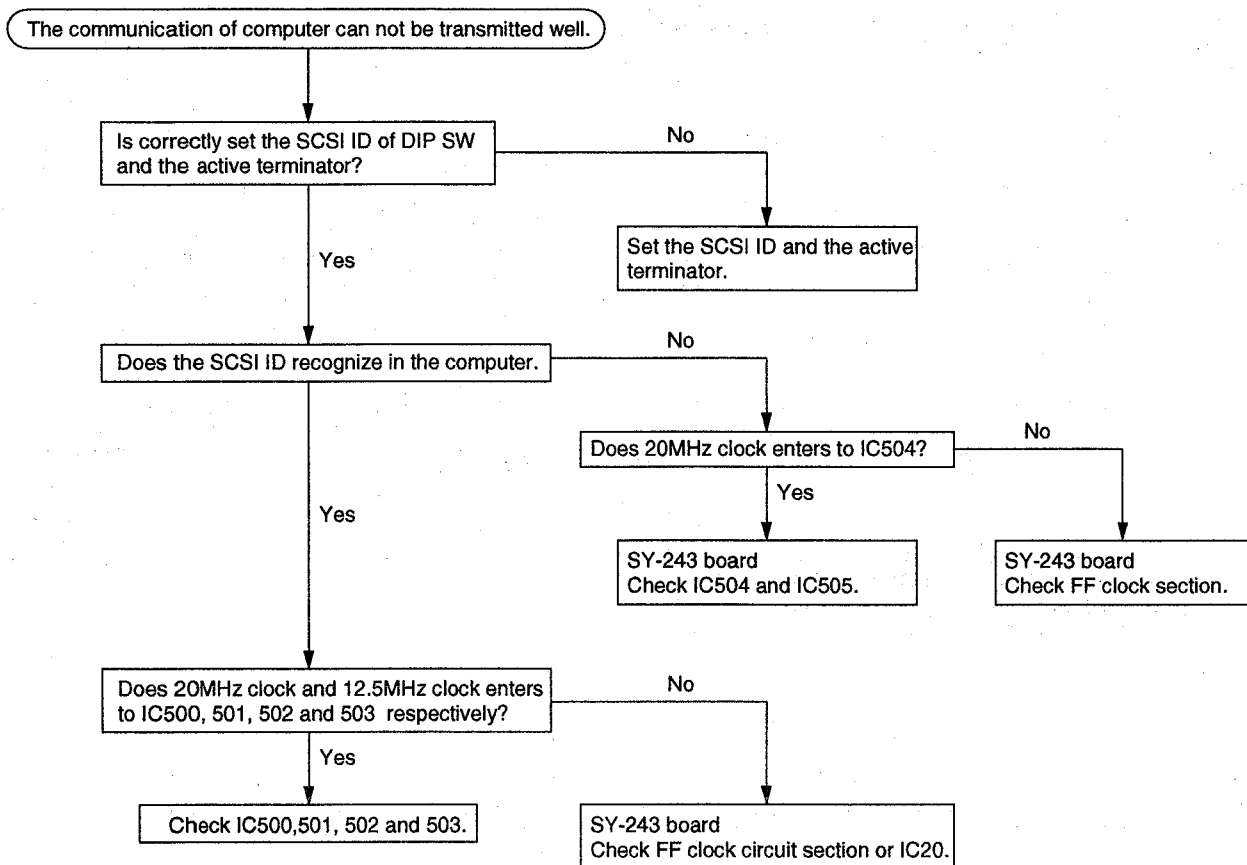
SECTION 5 TROUBLE SHOOTING

5-1. PROCESSOR BLOCK





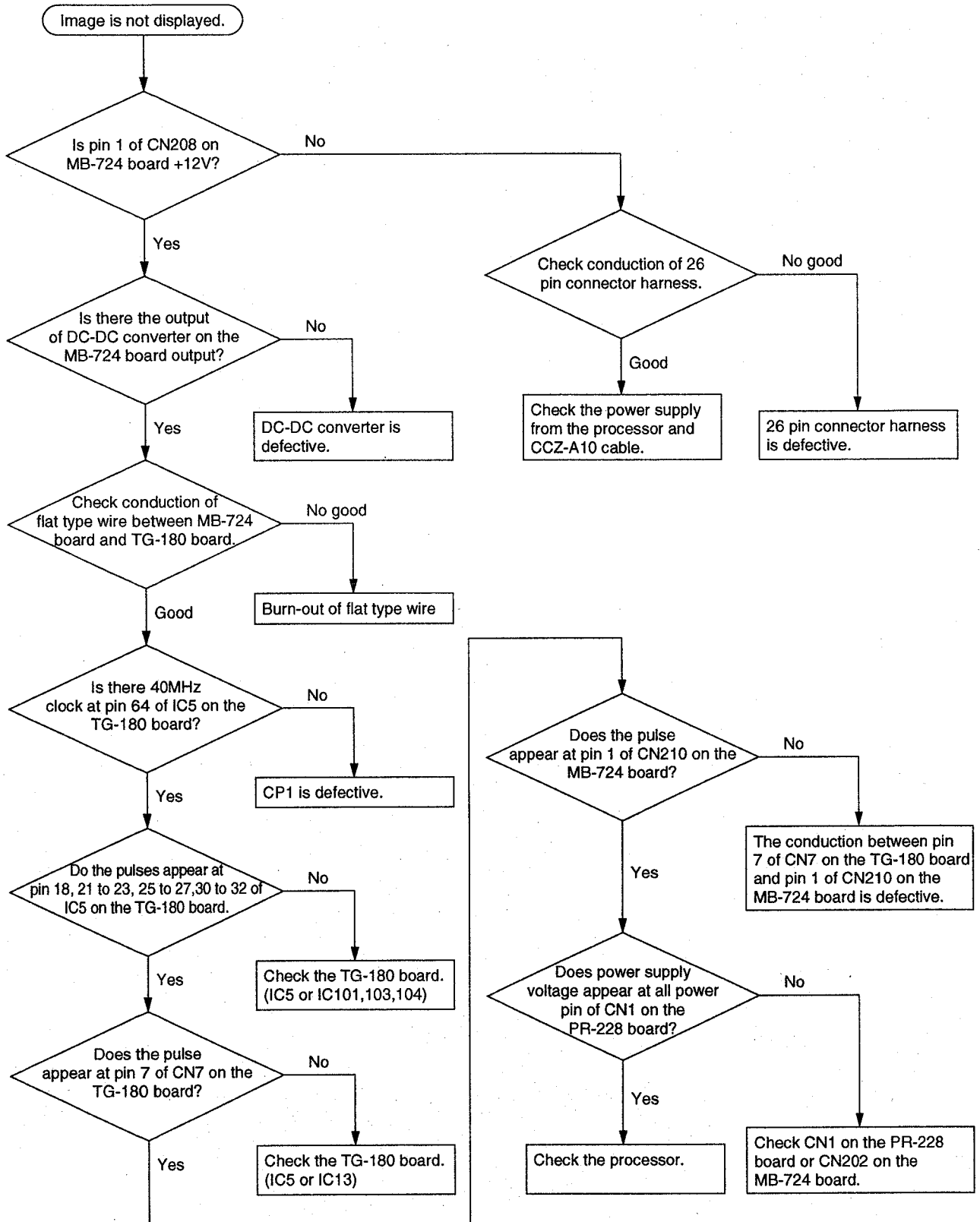




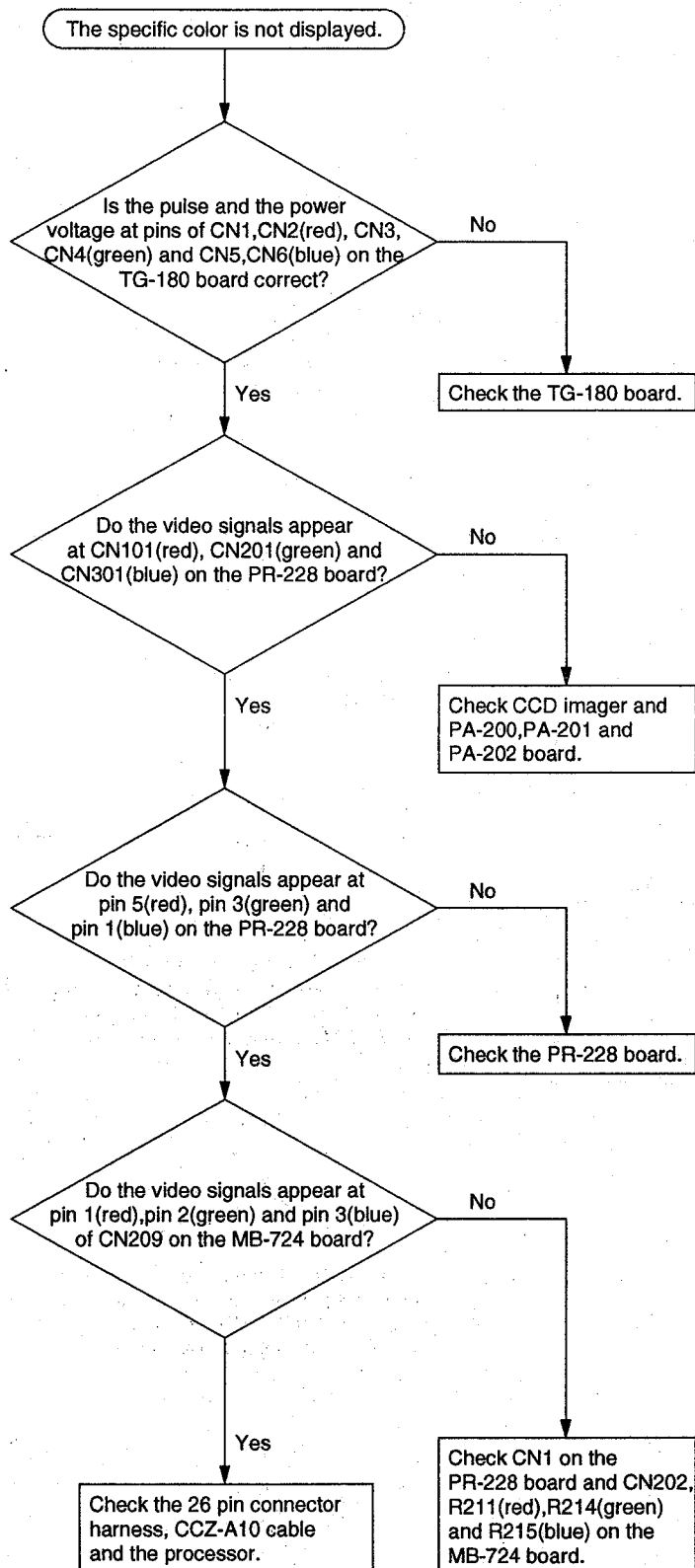
5-2. CAMERA BLOCK

- (1) Picture is not indicated.
- (2) The specific color is not indicated.
- (3) The remote control can not be worked.
- (4) Zoom and focus of special lens can not be worked.
- (5) Flashlight does not flash.
- (6) White balance and black balance can not be adjusted.

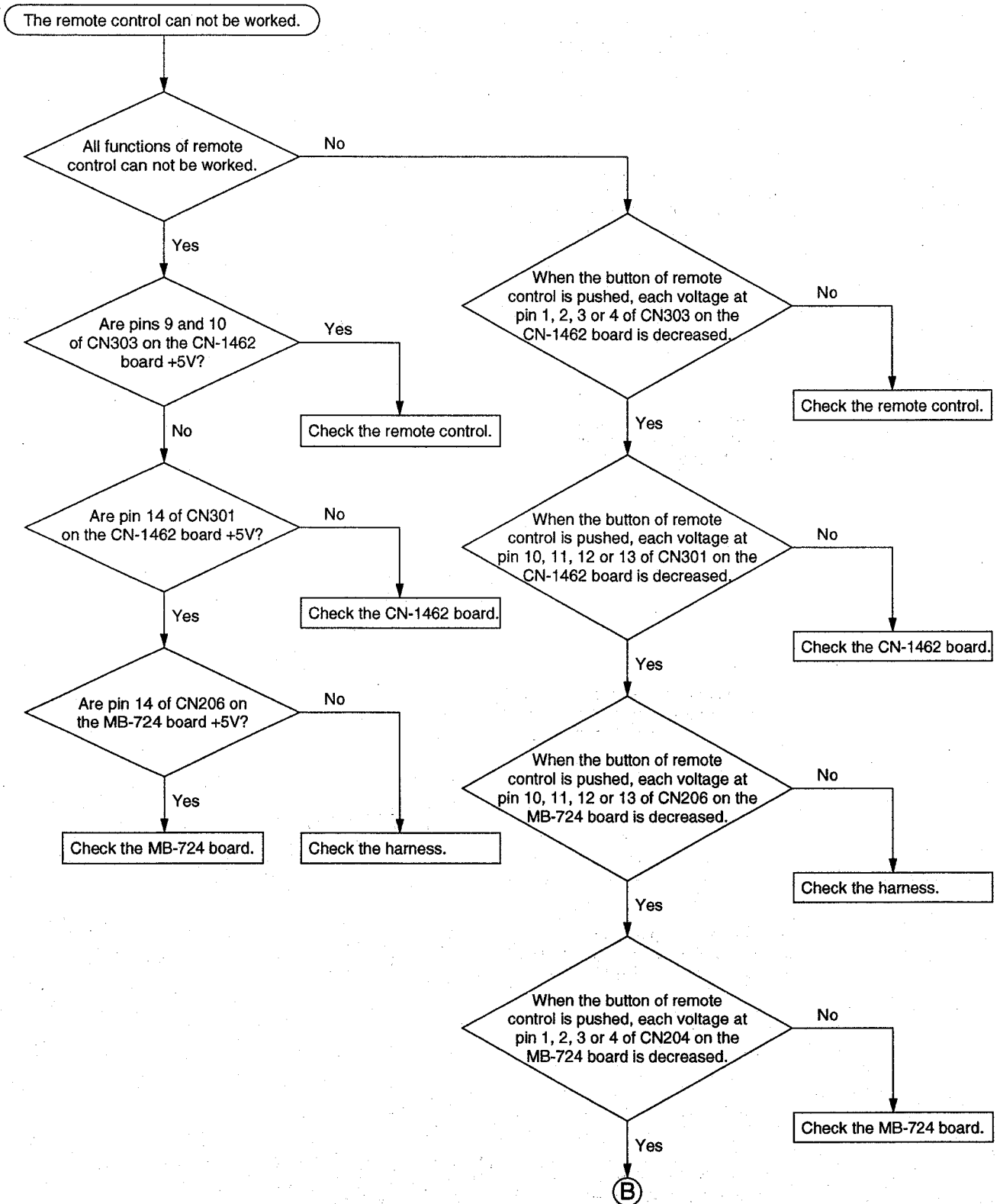
(1) Image is not displayed.

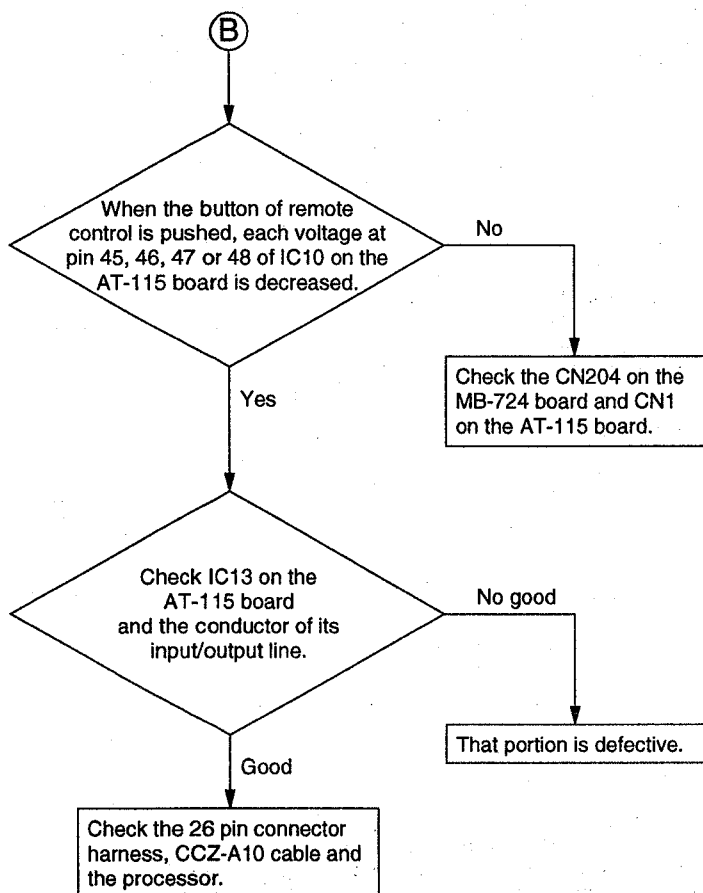


(2) The specific color(red, green, blue) is not displayed.

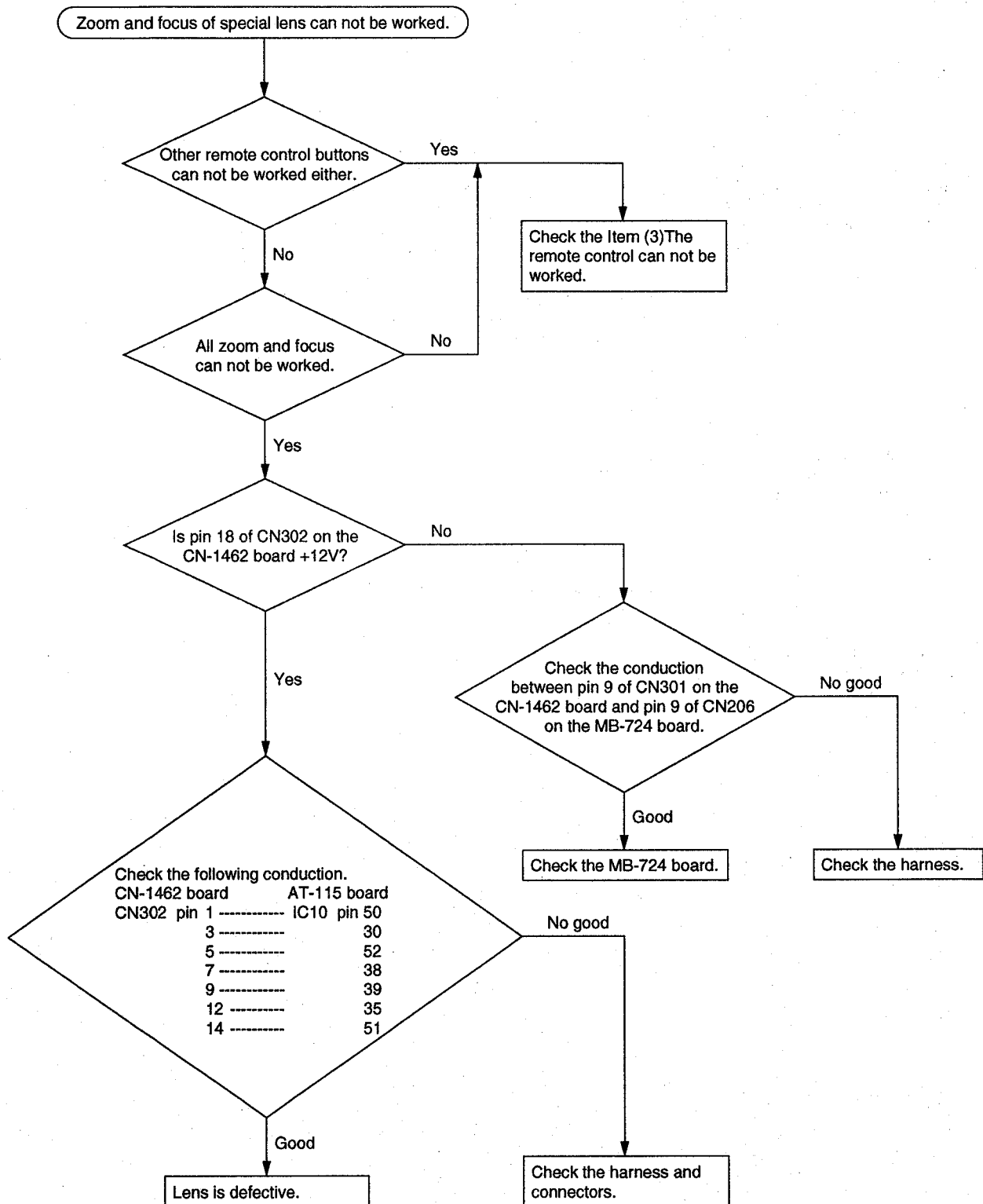


(3) The remote control can not be worked.

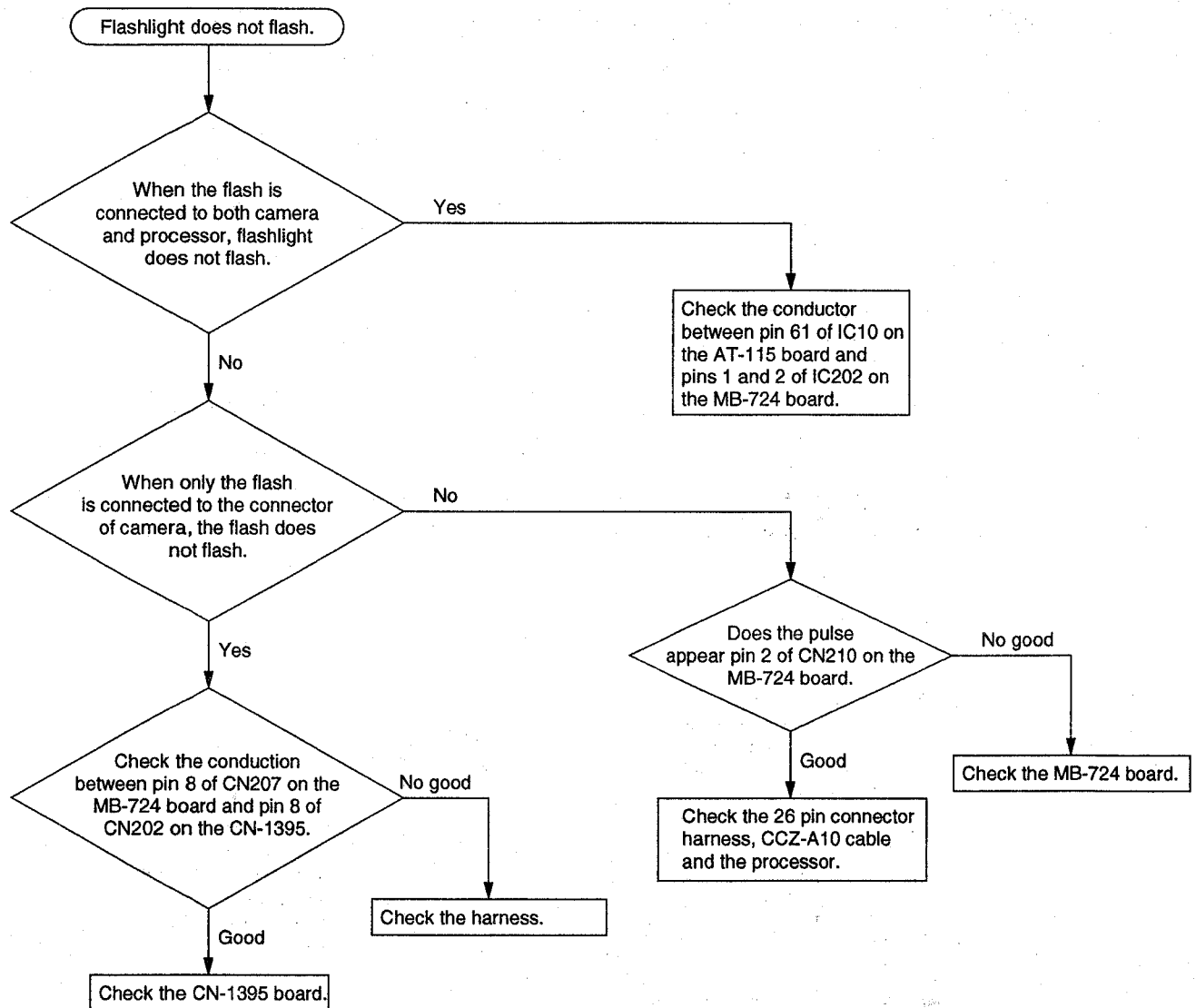




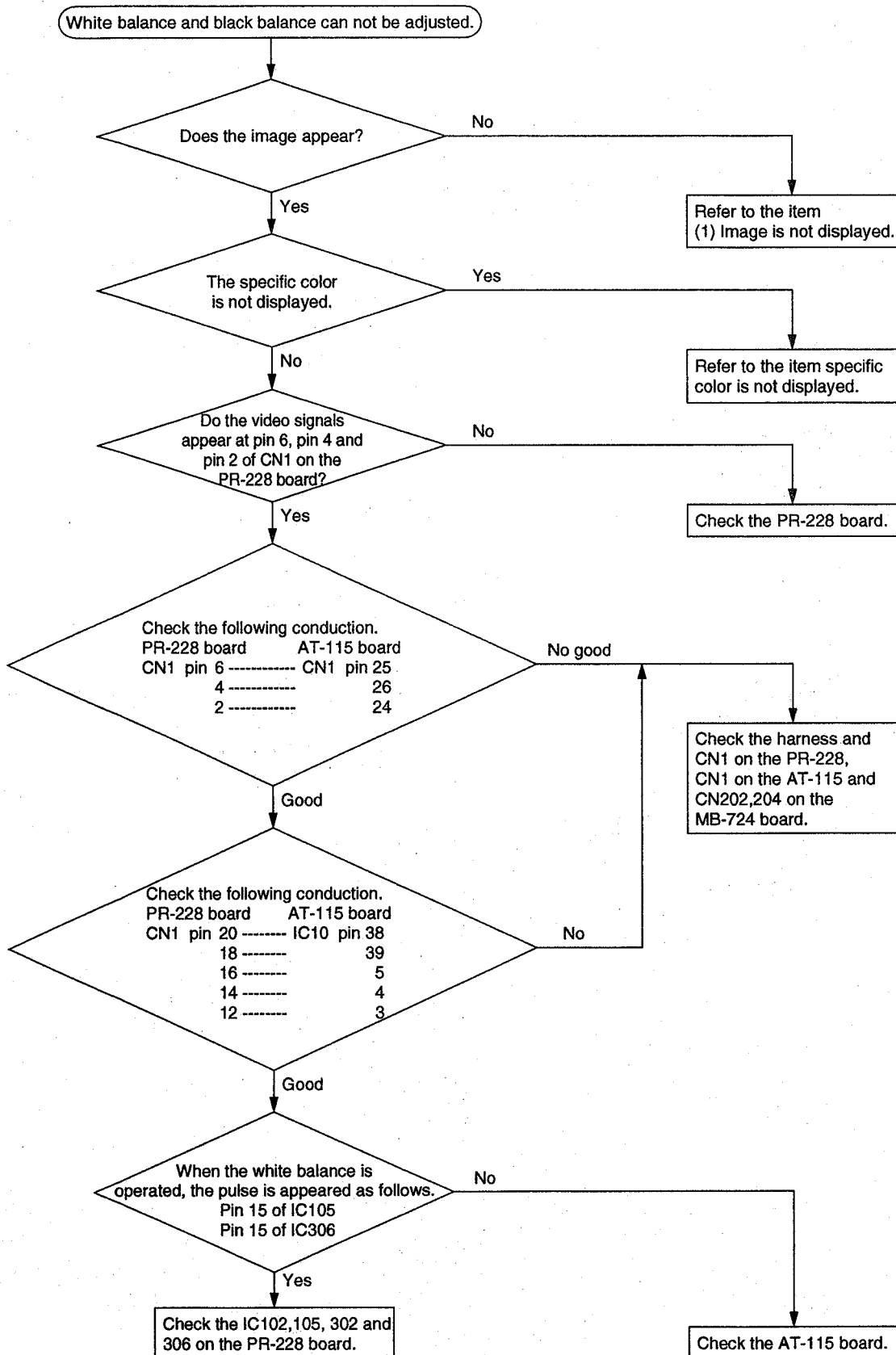
(4) Zoom and focus of special lens can not be worked.



(5) Flashlight does not flash.



(6) White balance and black balance can not be adjusted.



SECTION 6

SEMICONDUCTOR PIN ASSIGNMENTS

Semiconductors of which functions are equivalent are described here. For parts replacement, refer to the section of Spare Parts in this manual. The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

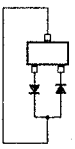
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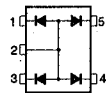
DIODE

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1SS226
1SS123-T1

-TOP VIEW-



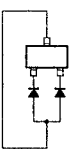
FMP1
FMP1-T-148

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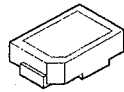


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RD5.6M-B2
RD9.1M-B1
RD3.6M-T1B
RD4.3M-T1B
RD5.6M-T1B
RD9.1M-T1B

-TOP VIEW-



1SS300-TE85L



LN1251C-TR;RED

-TOP VIEW-



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RD5.1SB-T1

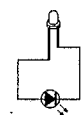


2GWJ42

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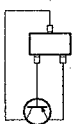
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RD5.6SB
RD15SB-T1
RD5.6SB-T1



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TLUG163

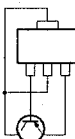
TRANSISTOR

-TOP VIEW-



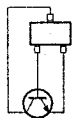
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-TOP VIEW-



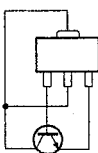
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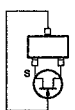
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2SC2714-O
2SC4081T106R
2SC4103-Q
2SC4176-B34
2SD1048-X7
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2SC2714O-TE85L
2SC4103T106-Q
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-TOP VIEW-



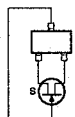
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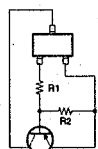
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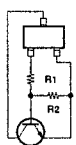
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DTA114EUA-T106

-TOP VIEW-

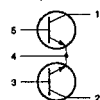


DTC114EU
(R1=10K, R2=10K)
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(R1=10K, R2=47K)
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(ROHM) (R1=4.7K, R2=OPEN)
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(R1 = 47 K, R2 = 47 K)
DTC114EUA-T106

-TOP VIEW-



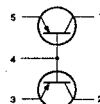
XN1501
XN1501-TX



-TOP VIEW-



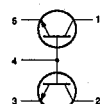
XN2401
XN2401-TX



-TOP VIEW-



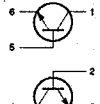
XN2501
XN2501-TX



-TOP VIEW-



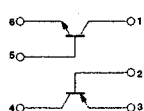
XN4501
XN4501-TW



-TOP VIEW-



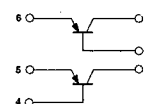
XN4601
XN4601-TW



-TOP VIEW-



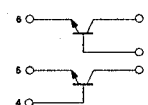
XN6401
XN6401-TW



-TOP VIEW-



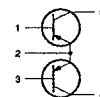
XN6501
XN6534
XN6501-TW
XN6534-TW



-TOP VIEW-



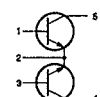
XP1401-TX



-TOP VIEW-



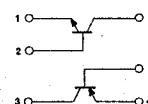
XP1501-TXE



-TOP VIEW-



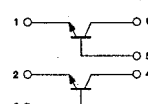
XP4601-TXE



-TOP VIEW-



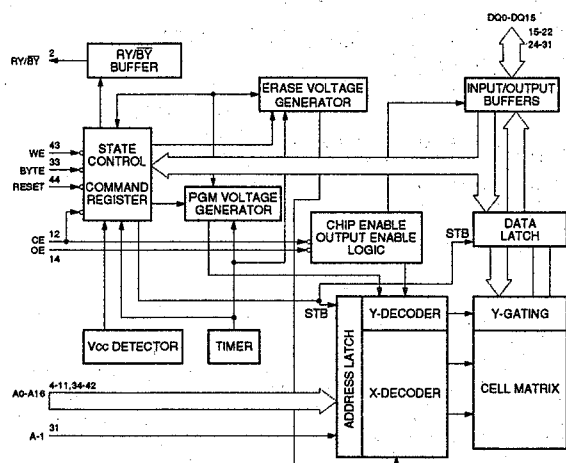
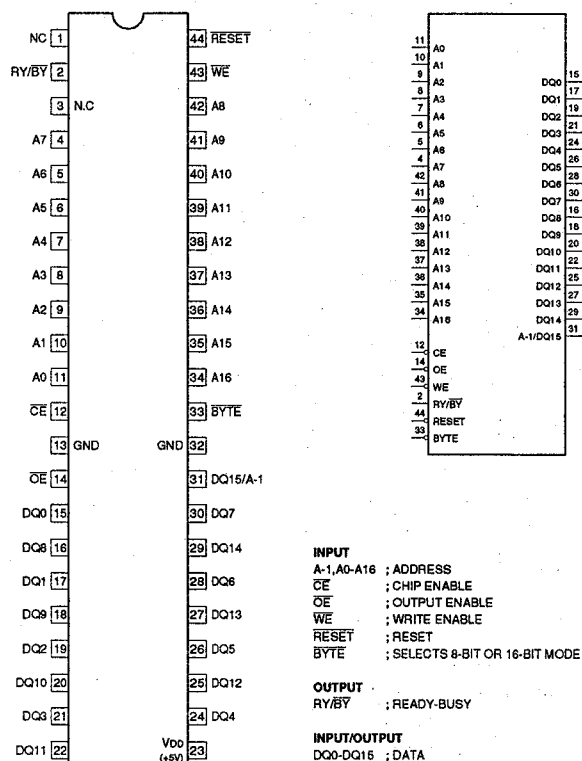
XP6501-TXE



AM29F200T-120SC (AMD)

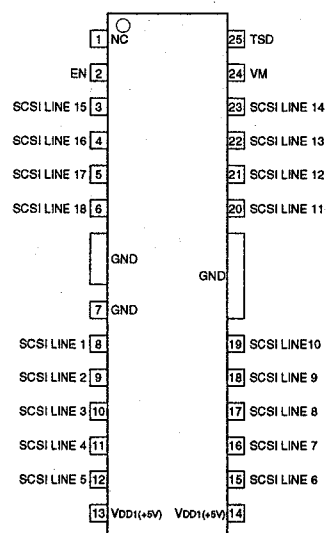
AM29F200T-120SC/T

C-MOS FLASH MEMORY
-TOP VIEW-

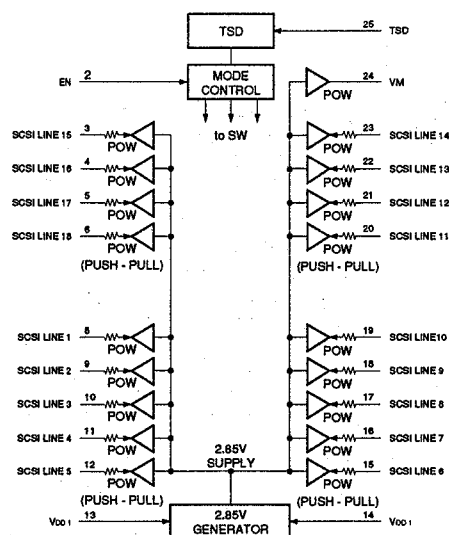


BH9595FP-Y-E2 (ROHM)

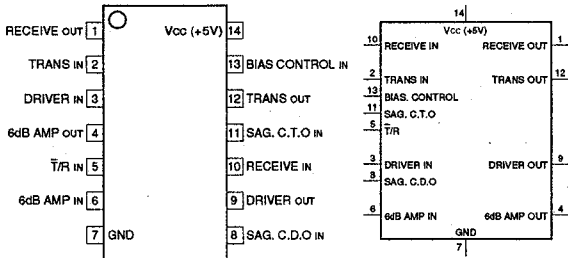
SCSI ACTIVE TERMINATOR
- TOP VIEW -



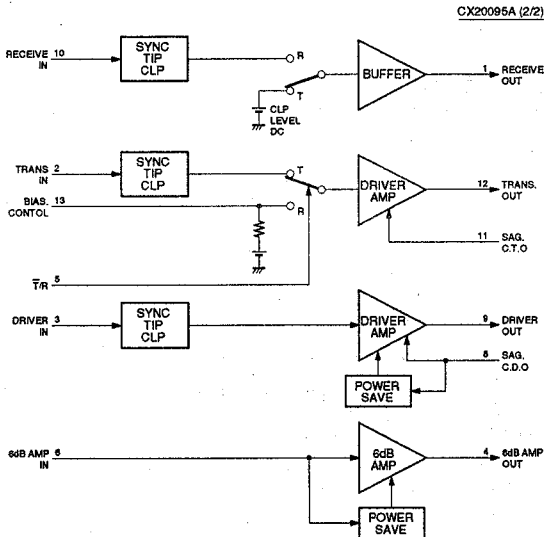
EN (PIN 2)	MODE
0	SCSI Line are High Impedance.
1	SCSI Line are connected with 2.85V through resistors.
	0 ; LOW LEVEL 1 ; HIGH LEVEL



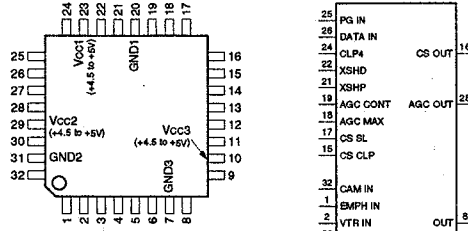
CX20095A-TH (SONY) FLAT PACKAGE

VIDEO LINE DRIVER AND RECEIVER
-TOP VIEW-

6dB AMP IN : 6dB AMP INPUT
 6dB AMP OUT : GAIN 6dB AMP OUTPUT
 BIAS CONTROL : BIAS CONTROL VOLTAGE INPUT
 DRIVER IN : DRIVER AMP INPUT
 DRIVER OUT : DRIVER AMP OUTPUT
 RECEIVE IN : RECEIVE AMP INPUT
 RECEIVE OUT : RECEIVE AMP OUTPUT
 SAG. C.T.O : SAG CORRECT DRIVE OUT INPUT
 SAG. C.D.O : SAG CORRECT TRANS OUT INPUT
 T/R : TRANS OR RECEIVE MODE SELECT INPUT
 TRANS IN : TRANS AMP INPUT
 TRANS OUT : TRANS AMP OUTPUT



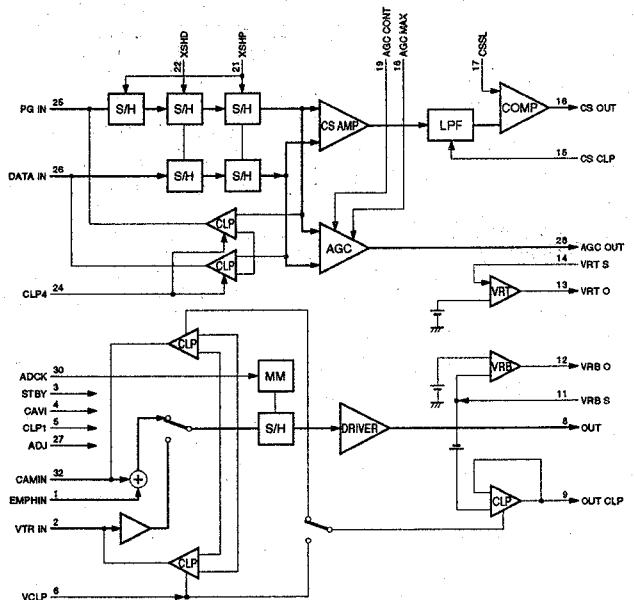
CXA1399Q (SONY) FLAT PACKAGE

HEAD AMPLIFIER FOR DIGITAL CCD CAMERA
-TOP VIEW-

PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	I	EMPHIN	17	I	CSSL
2	I	VTRIN	18	I	AGCMAX
3	I	STBY	19	I	AGCCONT
4	I	CAVI	20	—	GND
5	I	CLP1	21	I	XSHP
6	I	VCLP	22	I	XSHD
7	—	GND	23	—	Vcc
8	O	OUT	24	I	CLP4
9	O	OUTCLP	25	I	PGIN
10	—	Vcc	26	I	DATAIN
11	I	VRBS	27	I	ADJ
12	O	VRBO	28	O	AGCOUT
13	O	VRTO	29	—	Vcc
14	I	VRTS	30	I	ADCK
15	I	CSCLP	31	—	GND
16	O	CSOUT	32	I	CAMIN

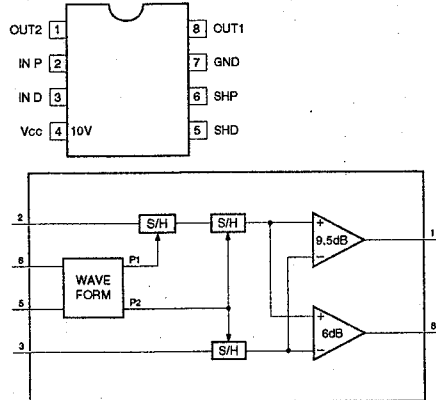
INPUT
 ADCK : S/H TRIGGER PULSE INPUT FOR A/D
 ADJ : INTERNAL S/H SAMPLING WIDTH ADJUSTMENT
 AGCCONT : AGC AMPLIFIER GAIN ADJUSTMENT
 AGCMAX : AGC AMPLIFIER MAX GAIN ADJUSTMENT
 CAMIN : AGC OUT (PIN-28) COUPLING DEPENDING ON CAPACITY
 CAVI : CAMERA MODE (EMPHIN → OUT) AND VTR MODE (VTRIN → OUT) SWITCHING AT INPUT STAGE
 CLP1 : CLAMP PULSE CLP1 : CAMERA
 CLP4 : CLAMP PULSE
 CSCLP : CAPACITOR CONNECTION FOR CLAMPING
 CSSL : THRESHOLD ADJUSTMENT FOR CHROMA SUPPRESSION
 DATAIN : CCD SIGNAL INPUT
 EMPHIN : HAS AGC OUT (PIN-28) OUTPUT SIGNAL PASSED THROUGH EXTERNAL BAND PASS FILTER (CHROMA COMPONENT ONLY)
 PGIN : CCD SIGNAL INPUT
 STBY : A1399 POWER SAVE MODE SWITCHING (NORMALLY GND)
 VCLP : CLAMP PULSE VCLP : VIDEO
 VRBS : INTERNAL OPERATION AMPLIFIER INVERTED INPUT IN 2V REGULATOR
 VRTS : INTERNAL OPERATION AMPLIFIER INVERTED INPUT IN 4V REGULATOR
 VTRIN : VIDEO PLAYBACK SIGNAL
 XSHD : HIGH SPEED PULSE INPUT FOR S/H
 XSHP : HIGH SPEED PULSE INPUT FOR S/H

OUTPUT
 AGCOUT : AGC OUTPUT
 CSOUT : FOR CHROMA SUPPRESSION AND FOR SELECTING S/H CIRCUIT OPERATION FOR A/D
 OUT : DRIVER OUTPUT STANDARD D RANGE : 2.2V
 OUTCLP : CLAMPS BLACK LEVEL OF OUT (PIN-8) OUTPUT SIGNAL AT 2.0V
 VRBO : 2V REGULATOR
 VRTO : 4V REGULATOR



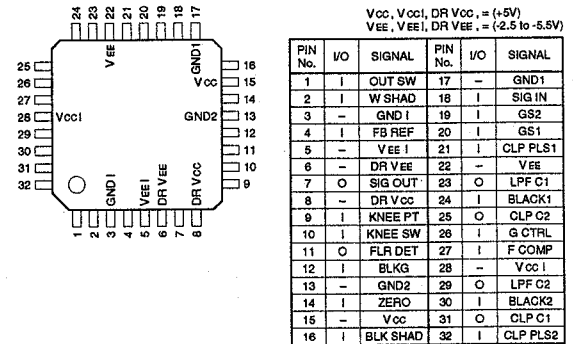
CXA1439M (SONY) FLAT PACKAGE CXA1439M-TH

CORRELATED DOUBLE SAMPLING
-TOP VIEW-

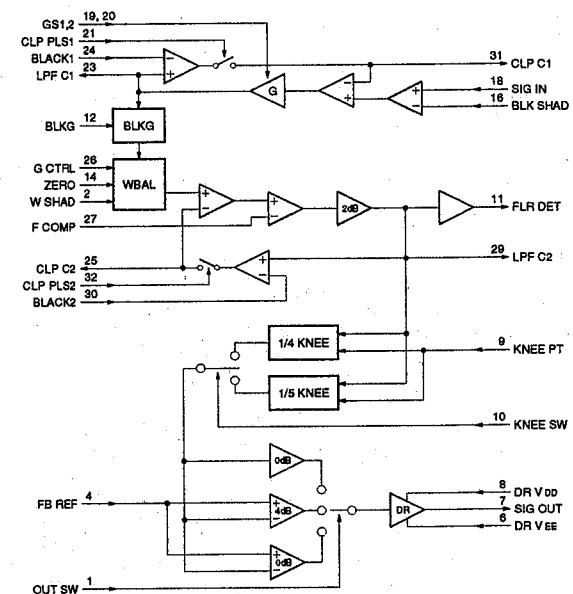


CXA1486Q-TH (SONY)

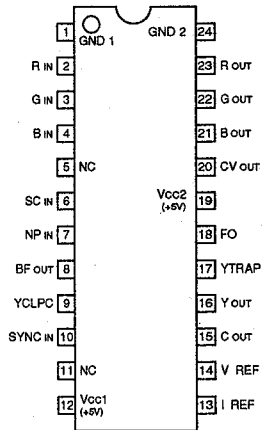
VIDEO AMPLIFIER FOR VIDEO CAMERA
-TOP VIEW-



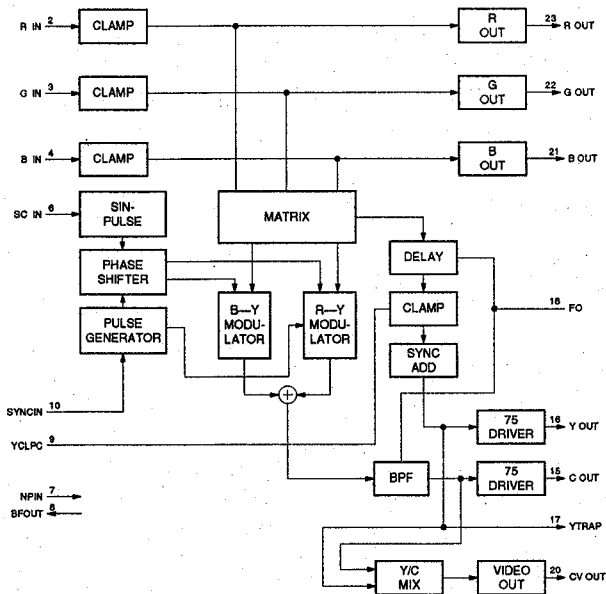
PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	OUT SW	17	-	GND1
2	I	W SHAD	18	I	SIG IN
3	-	GND I	19	I	GS2
4	I	FB REF	20	I	GS1
5	-	VEE I	21	I	CLP PLS1
6	-	DR VEE	22	-	VEE
7	O	SIG OUT	23	O	LPF C1
8	-	DR Vcc	24	I	BLACK1
9	I	KNEE PT	25	O	CLP C2
10	I	KNEE SW	26	I	G CTRL
11	O	FLR DET	27	I	F COMP
12	I	BLKG	28	-	Vcc I
13	-	GND2	29	O	LPF C2
14	I	ZERO	30	I	BLACK2
15	-	Vcc	31	O	CLP C1
16	I	BLK SHAD	32	I	CLP PLS2

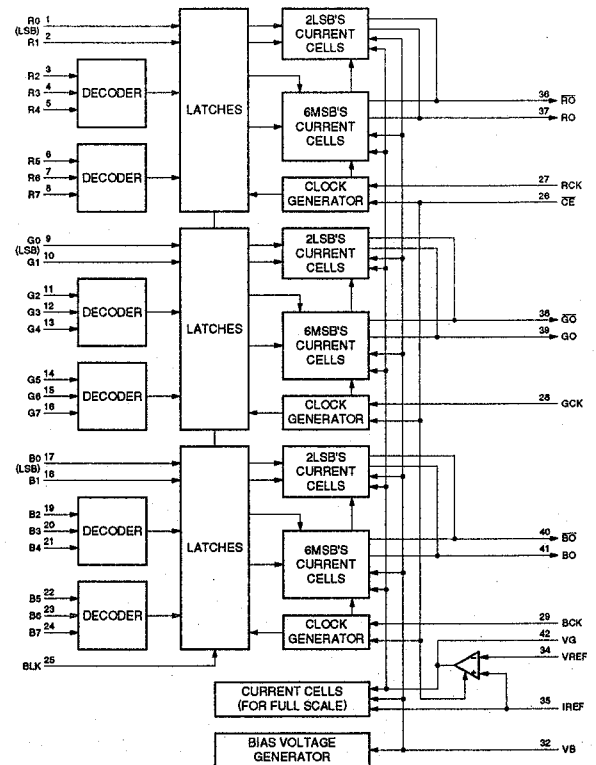
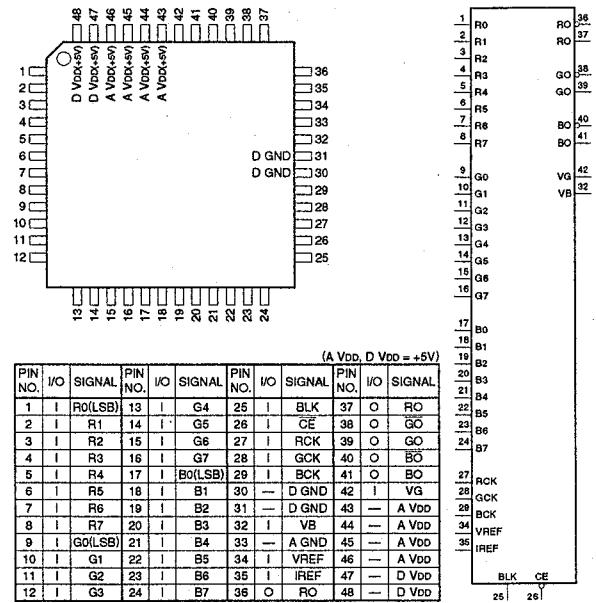


CXA1645M (SONY) FLAT PACKAGE
CXA1645M-T6

 RGB COMPOSITE ENCODER
 — TOP VIEW —

INPUT
 B IN : ANALOG B
 G IN : ANALOG G
 NP IN : NTSC/PAL MODE SELECT
 R IN : ANALOG R
 SC IN : SUB-CARRIER
 SYNC IN : COMPOSITE SYNC SIGNAL

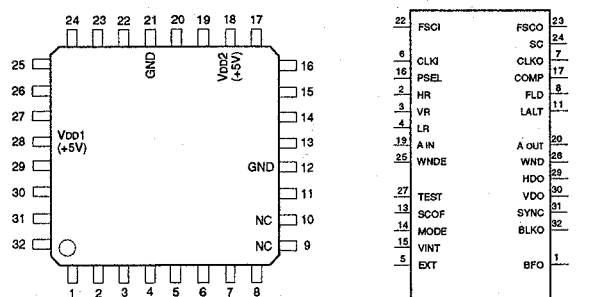
OUTPUT
 B OUT : ANALOG B
 BF OUT : BF PULSE FOR MONITOR
 C OUT : CHROMA SIGNAL
 CV OUT : COMPOSITE VIDEO
 G OUT : ANALOG G
 R OUT : ANALOG R
 Y OUT : Y SIGNAL

OTHER
 FO : f_0 ADJUST FOR INNER FILTER
 IREF : REFERENCE CURRENT
 VREF : REFERENCE VOLTAGE
 YCLPC : Y SIGNAL CLAMP CAPACITOR
 YTRAP : Y SIGNAL CROSS-COLOR TRAP

CXD1178Q (SONY)

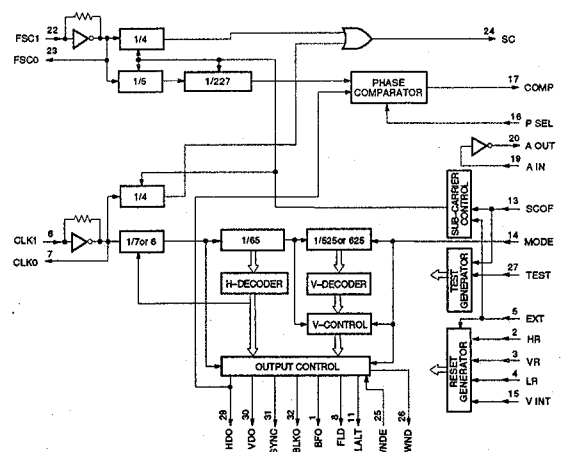
 C-MOS 3CH 8-BIT 40MHz D / A CONVERTER
 — TOP VIEW —


CXD1159Q (SONY)
CXD1159Q-TH

C-MOS SYNC GENERATOR
-TOP VIEW-



PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	O	BFO	9	—	NC	17	O	COMP	25	I	WNDE
2	I	HR	10	—	NC	18	—	VDD2(+5V)	26	O	WND
3	I	VR	11	O	LALT	19	I	AIN	27	I	TEST
4	I	LR	12	—	GND	20	O	AOUT	28	—	VDD1(+5V)
5	I	EXT	13	I	SCOF	21	—	GND	29	O	HDO
6	I	CLKI	14	I	MODE	22	I	FSCI	30	O	VDO
7	O	CLKO	15	I	VINT	23	O	FSCO	31	O	SYNC
8	O	FLD	16	I	PSEL	24	O	SC	32	O	BLKO



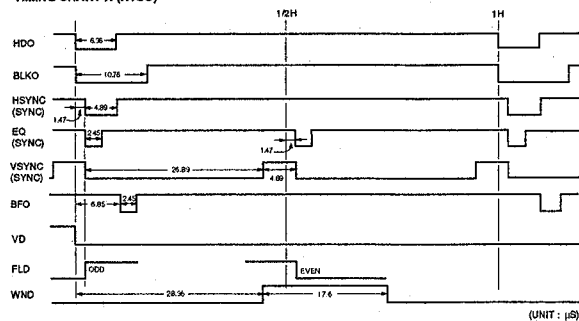
INPUT

- AIN : FILTER INVERTER INPUT
- CLKI : CLOCK INPUT (NTSC : 14.31818MHz / PAL : 14.1875MHz)
- EXT : INT/EXT (L : INT)
- FSCI : 4FSC CLOCK INPUT
- HR : H RESET
- LR : LALT RESET
- MODE : NTSC/PAL (L : NTSC)
- PSEL : POLARITY SELECT FOR PHASE COMP
- SCOF : SUBCARRIER OFF (L : OFF)
- TEST : TEST INPUT
- VINT : INITIALIZE
- VR : V RESET
- WNDE : WINDOW ENABLE

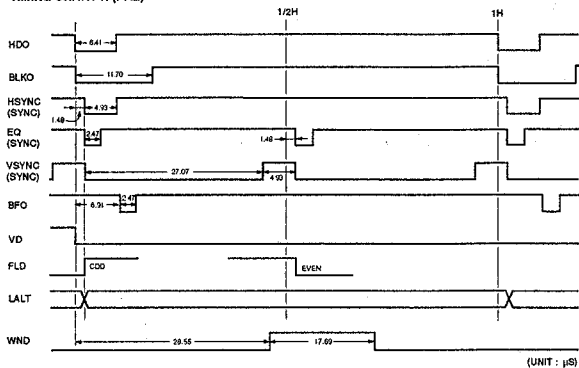
OUTPUT

- AOUT : FILTER INVERTER OUTPUT
- BFO : BURST FLAG PULSE
- BLKO : COMPOSITE BLANKING PULSE
- CLKO : CLOCK OUTPUT
- COMP : PHASE COMP
- FLD : FIELD PULSE
- FSCO : 4FSC CLOCK OUTPUT
- HDO : H DRIVE PULSE
- LALT : LINE ALTERNATE PULSE
- SC : SUBCARRIER
- SYNC : COMPOSITE SYNC PULSE
- VDO : V DRIVE PULSE
- WND : WINDOW

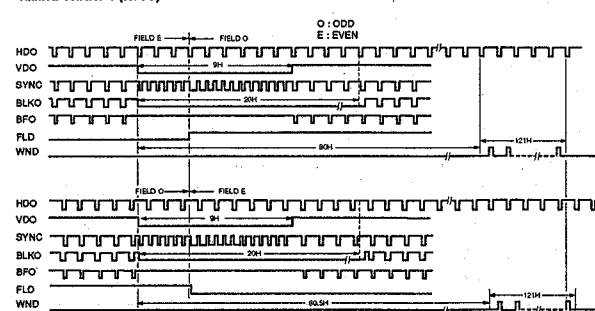
TIMING CHART H (NTSC)



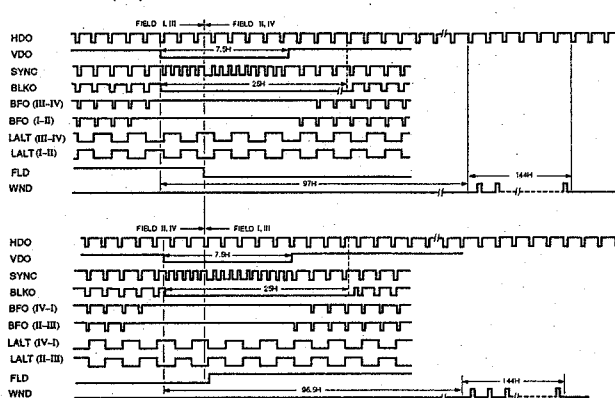
TIMING CHART H (PAL)



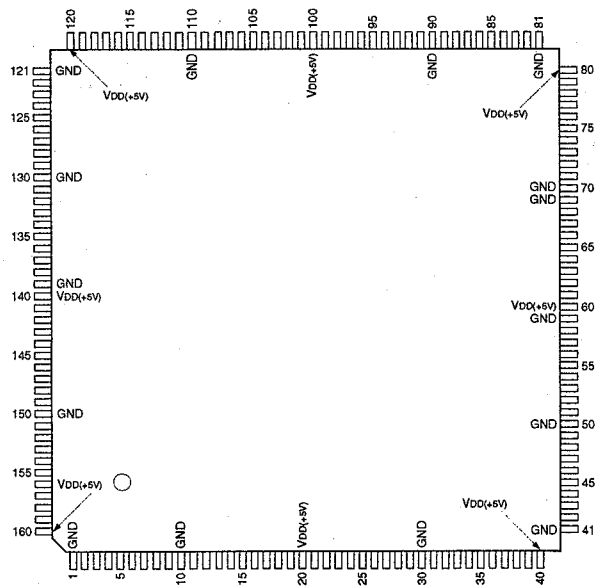
TIMING CHART V (NTSC)



TIMING CHART V (PAL)



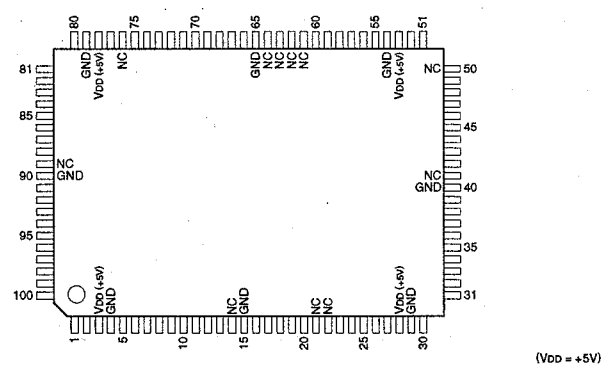
CXD207-109Q (SONY)

C-MOS GATE ARRAY
—TOP VIEW—

(VDD = +5 V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	—	GND	41	—	GND	81	—	GND	121	—	GND
2	I	D9	42	I	M RQ	82	I	CAS	122	O	CA5
3	I	D10	43	O	M AK	83	I	RAS	123	O	CA6
4	I	D11	44	O	M WE	84	O	CRKEY	124	O	CA7
5	I	D12	45	O	M RE	85	O	CRP	125	O	CA8
6	I	D13	46	O	TLR	86	O	CRIG	126	O	CA9
7	I	D14	47	O	TLW	87	O	CRB	127	O	CA10
8	I	D15	48	I	J RQ	88	O	IN 1	128	O	CA11
9	I	A23	49	O	J AK	89	O	IN 2	129	O	CA12
10	—	GND	50	—	GND	90	—	GND	130	—	GND
11	I	A22	51	O	JWE	91	O	IN 3	131	O	CA13
12	I	A21	52	O	JRE	92	O	IN 4	132	O	CA14
13	I	A20	53	I	F RQ	93	O	OUT1	133	O	CA15
14	I	A19	54	O	F AK	94	O	OUT2	134	O	CA16
15	I	A18	55	O	F WE	95	O	OUT3	135	I/O	CD0
16	I	A17	56	I	FD TAK	96	O	OUT4	136	I/O	CD1
17	I	A16	57	O	DMDIR	97	O	OUT5	137	I/O	CD2
18	I	A15	58	O	LDEN1	98	O	OUT6	138	I/O	CD3
19	I	A14	59	—	GND	99	O	IN 5	139	—	GND
20	—	VDD	60	—	VDD	100	—	VDD	140	—	VDD
21	I	A13	61	O	UDEN1	101	I	RST	141	I/O	CD4
22	I	A12	62	O	LDEN2	102	I	TST1	142	I/O	CD5
23	I	A11	63	O	UDEN2	103	O	PRCS	143	I/O	CD6
24	I	A10	64	I	RHD	104	O	EECS	144	I/O	CD7
25	I	A9	65	I	RVD	105	O	JPCS	145	O	DTACK
26	I	A8	66	I	RFLD	106	O	FMCS	146	I	RD
27	I	A7	67	O	BLKO	107	O	ESCS	147	I	LDS
28	I	A6	68	I	RCK	108	O	MSCS	148	I	UDS
29	I	A5	69	—	GND	109	O	FWCS	149	I	AS
30	—	GND	70	—	GND	110	—	GND	150	—	GND
31	I	A4	71	I	WVD	111	O	CRDG	151	I	SYCK(16M)
32	I	A3	72	I	WFLD	112	O	COE	152	I	TST2
33	I	A2	73	I	WCK	113	O	CWE	153	O	DR00
34	I	A1	74	O	VINT	114	O	OCS	154	O	DR01
35	I	TCK	75	O	ADAEN	115	O	CA0	155	O	DR02
36	I	TDI	76	I	WCSNC	116	O	CA1	156	I	DAK0
37	I	TENA1	77	O	WEXT	117	O	CA2	157	I	DAK1
38	O	TDO	78	O	WCTHD	118	O	CA3	158	I	DAK2
39	I	VST	79	O	RCTHD	119	O	CA4	159	I	DB
40	—	VDD	80	—	VDD	120	—	VDD	160	—	VDD

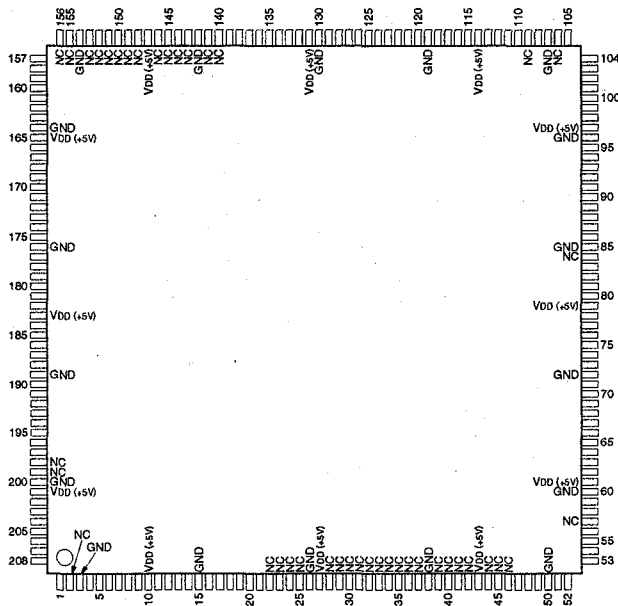
CXD209-107Q (SONY)

C-MOS GATE ARRAY
—TOP VIEW—

(VDD = +5 V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	DA0	21	—	NC	41	—	NC	61	—	NC	81	I	GI2
2	I	DA1	22	—	NC	42	O	GO0	62	—	NC	82	I	GI3
3	—	VDD	23	—	TCK	43	O	GO1	63	—	NC	83	I	GI4
4	—	GND	24	—	TDI	44	O	GO2	64	—	NC	84	I	GI5
5	I	DA2	25	—	TENA1	45	O	GO3	65	—	GND	85	I	GI6
6	I	DA3	26	—	TDO	46	O	GO4	66	I	BI0	86	I	GI7
7	I	DA4	27	—	VDT	47	O	GO5	67	I	BI1	87	I	GI8
8	I	DA5	28	—	VDD	48	O	GO6	68	I	BI2	88	I	GI9
9	I	AD0	29	—	GND	49	O	GO7	69	I	BI3	89	—	NC
10	I	AD1	30	—	CK	50	—	NC	70	I	BI4	90	—	GND
11	I	AD3	31	I	RST	51	O	RO0	71	I	BI5	91	I	RI0
12	I	CS	32	I	BO0	52	O	RO1	72	I	BI6	92	I	RI1
13	I	WR	33	O	BO1	53	—	VDD	73	I	BI7	93	I	RI2
14	—	NC	34	O	BO2	54	—	GND	74	I	BI8	94	I	RI3
15	—	GND	35	O	BO3	55	O	RO2	75	I	BI9	95	I	RI4
16	I	MX0	36	O	BO4	56	O	RO3	76	—	NC	96	I	RI5
17	I	MX1	37	O	BO5	57	O	RO4	77	I	GI0	97	I	RI6
18	I	UV	38	O	BO6	58	O	RO5	78	—	VDD	98	I	RI7
19	I	EHK	39	O	BO7	59	O	RO6	79	—	GND	99	I	RI8
20	I	P4	40	O	GND	60	O	RO7	80	I	GI1	100	I	RI9

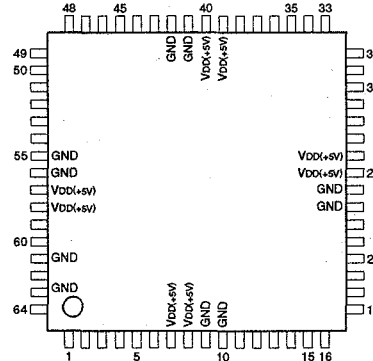
CXD210-108Q (SONY)

C-MOS GATE ARRAY
-TOP VIEW-

(VDD = +5V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	IRCI7	43	—	VDD	85	—	GND	127	I/O	GI2	169	O	OGCO0			
2	—	NC	44	—	NC	86	I	IADRS0	128	I/O	GI1	170	O	OGCO1			
3	—	GND	45	—	NC	87	I	IADRS1	129	I/O	GI0	171	O	OGCO2			
4	I	IGCI0	46	—	NC	88	I	IADRS2	130	—	GND	172	O	OGCO3			
5	I	IGCI1	47	I	TCK	89	I	IADRS3	131	—	VDD	173	O	OGCO4			
6	I	IGCI2	48	I	TDI	90	I	IADRS4	132	I/O	BI7	174	O	OGCO5			
7	I	IGCI3	49	I	TENA1	91	I	ICEX	133	I/O	BI6	175	O	OGCO6			
8	I	IGCI4	50	—	GND	92	I	IREADX	134	I/O	BI5	176	—	GND			
9	I	IGCI5	51	O	TDO	93	I	IWRITEX	135	I/O	BI4	177	O	OGCO7			
10	—	VDD	52	I	VST	94	O	OINTX	136	I/O	BI3	178	O	OGCO8			
11	I	IGCI6	53	I/O	BO0	95	I	IRESETX	137	I/O	BI2	179	O	OGCO9			
12	I	IGCI7	54	I/O	BO1	96	—	GND	138	I/O	BI1	180	O	OBCC0			
13	I	IBC10	55	I/O	BO2	97	—	VDD	139	I/O	BI0	181	O	OBCC1			
14	I	IBC11	56	I/O	BO3	98	I/O	DB0	140	—	NC	182	O	OBCC2			
15	—	GND	57	—	NC	99	I/O	DB1	141	—	NC	183	—	VDD			
16	I	IBC12	58	I/O	BO4	100	I/O	DB2	142	—	GND	184	O	OBCC3			
17	I	IBC13	59	I/O	BO5	101	I/O	DB3	143	—	NC	185	O	OBCC4			
18	I	IBC14	60	—	GND	102	I/O	DB4	144	—	NC	186	O	OBCC5			
19	I	IBC15	61	—	VDD	103	I/O	DB5	145	—	NC	187	O	OBCC6			
20	I	IBC16	62	I/O	BO6	104	I/O	DB6	146	—	NC	188	O	OBCC7			
21	I	IBC17	63	I/O	BO7	105	I/O	DB7	147	—	VDD	189	—	GND			
22	—	NC	64	I/O	GO0	106	—	NC	148	—	NC	190	O	OBCC8			
23	—	NC	65	I/O	GO1	107	—	GND	149	—	NC	191	O	OBCC9			
24	—	NC	66	I/O	GO2	108	I	ICLK	150	—	NC	192	O	OEXEHKN			
25	—	NC	67	I/O	GO3	109	—	NC	151	—	NC	193	O	OP4			
26	—	GND	68	I/O	GO4	110	I/O	I1REQX	152	—	NC	194	O	OMTX0			
27	—	VDD	69	I/O	GO5	111	I/O	I1ACKX	153	—	NC	195	O	OMTX1			
28	—	NC	70	I/O	GO6	112	I/O	RI7	154	—	GND	196	O	CUV			
29	—	NC	71	I/O	GO7	113	I/O	RI6	155	—	NC	197	O	OCLK			
30	—	NC	72	—	GND	114	—	VDD	156	—	NC	198	—	NC			
31	—	NC	73	I/O	RC0	115	I/O	RI5	157	O	ORCO0	199	—	NC			
32	—	NC	74	I/O	RC1	116	I/O	RI4	158	O	ORCO1	200	—	GND			
33	—	NC	75	I/O	RC2	117	I/O	RI3	159	O	ORCO2	201	—	VDD			
34	—	NC	76	I/O	RC3	118	I/O	RI2	160	O	ORCO3	202	I	IRC10			
35	—	NC	77	I/O	RC4	119	—	GND	161	O	ORCO4	203	I	IRC11			
36	—	NC	78	I/O	RC5	120	I/O	RI1	162	O	ORCO5	204	I	IRC12			
37	—	NC	79	—	VDD	121	I/O	RI0	163	O	ORCO6	205	I	IRC13			
38	—	GND	80	I/O	RC6	122	I/O	GI7	164	—	GND	206	I	IRC14			
39	—	NC	81	I/O	RC7	123	I/O	GI6	165	—	VDD	207	I	IRC15			
40	—	NC	82	I/O	O1REQX	124	I/O	GI5	166	O	ORCO7	208	I	IRC16			
41	—	NC	83	I/O	O1ACKX	125	I/O	GI4	167	O	ORCO8						
42	—	NC	84	—	NC	126	I/O	GI3	168	O	ORCO9						

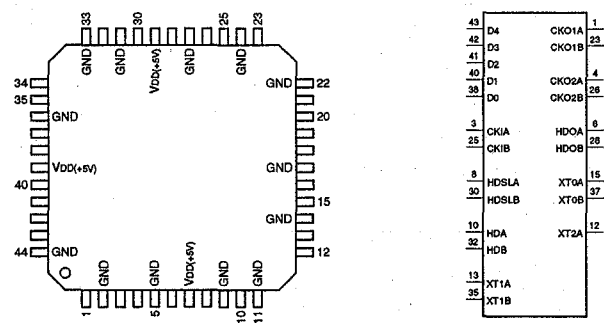
CXD8843R (SONY)

C-MOS GATE ARRAY
-TOP VIEW-

(VDD = +5V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	O	XPLLH	17	I	XTRIG	33	I	SIBLK	49	I	CLPGATE
2	I	PPLL	18	I	VSTBY	34	O	WDISPLAY	50	O	CLP1
3	I	PREF	19	I	CS	35	O	VWINDOW	51	O	CLP2
4	O	EXTH	20	I	SI	36	O	HWINDOW	52	O	CLP3
5	I	RSTIN	21	I	SCK	37	O	VD	53	O	OBPCLP
6	I	EXTSYN	22	I	STB	38	O	HD	54	O	PBLK
7	—	VDD	23	—	GND	39	—	VDD	55	—	GND
8	—	VDD	24	—	GND	40	—	VDD	56	—	GND
9	—	GND	25	—	VDD	41	—	GND	57	—	VDD
10	—	GND	26	—	VDD	42	—	GND	58	—	VDD
11	I	EXTHD	27	O	EXTMODE	43	O	FLD	59	O	SYSCLK
12	I	EXTVD	28	O	HVMODE	44	O	VBLK	60	O	CKQ
13	O	HR	29	I	TEST0	45	O	CMPBLK	61	—	GND
14	I	HRI	30	I	TEST1	46	O	HBLK	62	I	CKIN
15	O	VR	31	I	TEST2	47	O	SYNC1	63	—	GND
16	I	VRI	32	I	SBKRVS	48	O	SYNC2	64	O	PCO

CXD8932Q (SONY)

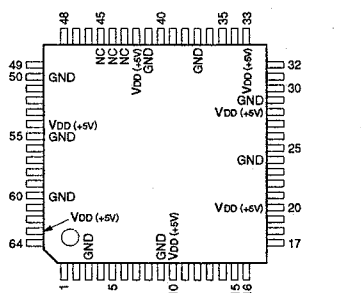
C-MOS GATE ARRAY
-TOP VIEW-

(VDD = +5V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	O	CKO1A	12	O	XT2A	23	O	CKO1B	34	—	NC
2	—	GND	13	I	XT1A	24	—	GND	35	I	XT1B
3	I	CK1A	14	—	GND	25	I	CK1B	36	—	GND
4	O	CKO2A	15	O	XT0A	26	O	CKO2B	37	O	XT0B
5	—	GND	16	—	NC	27	—	GND	38	I	D0
6	O	HDOA	17	—	GND	28	O	HDOB	39	—	VDD
7	—	VDD	18	—	NC	29	—	VDD	40	I	D1
8	I	HDSLA	19	—	NC	30	I	HDSLB	41	I	D2
9	—	GND	20	—	NC	31	—	GND	42	I	D3
10	I	HDA	21	—	NC	32	I	HDB	43	I	D4
11	—	GND	22	—	GND	33	—	GND	44	—	GND

CXD2437TQ (SONY)

C-MOS TIMING GENERATOR FOR PROGRESSIVE SCAN
READOUT SYSTEM CCD IMAGE SENSOR
-TOP VIEW-



(VDD = +5V)											
PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	O	OSCO	17	—	CH	33	—	VDD	49	—	TEST8
2	I	OSCI	18	—	XSG	34	O	XCP0B	50	—	GND
3	—	GND	19	O	XSUB	35	O	XCPDM	51	O	CL
4	I	INT	20	—	VDD	36	O	PBLK	52	O	CDL
5	I	TEST1	21	O	XV3	37	—	GND	53	O	CKO
6	I	STRB	22	O	XV2	38	—	TEST5	54	—	VDD
7	I	DCLK	23	O	XV1	39	—	TEST6	55	—	GND
8	I	DATA	24	—	GND	40	—	TEST7	56	I	XGSTR
9	—	GND	25	O	XH1	41	—	GND	57	I	STDBY
10	—	VDD	26	O	XH2	42	—	VDD	58	I	TRIG
11	I	RM	27	O	RG	43	—	NC	59	I	ESG
12	I	TEST2	28	—	VDD	44	—	NC	60	—	GND
13	I	FSE	29	—	GND	45	—	NC	61	I	HD
14	I	SMDE	30	O	XSHP	46	O	ID	62	I	VD
15	I	TEST3	31	O	XSHD	47	O	WEN	63	—	VDD
16	I	TEST4	32	O	XRS	48	O	BUSY	64	I	CKI

INPUT

```

CKI      : CLOCK
DATA     : SHUTTER SPEED SETTING
DCLK     : SHUTTER SPEED SETTING
ESG      : EXTERNAL READ
FSE      : EXTERNAL TRIGGER SWEEP THROW AWAY SELECT
          (H: HIGH SPEED SWEEP THROW AWAY EFFECTIVE/
          L: HIGH SPEED SWEEP THROW AWAY INVALID)
HD       : HORIZONTAL SYNC
OSCI     : OSCILLATOR INVERTER
INT      : INTERNAL OSCILLATOR SELECT
          (H: INTERNAL OSCILLATOR CELLA: CKI INPUT EFFECTIVE)
RM       : FRAME RATE SELECT (H: NORMAL READ/L: TWICE SPEED READ)
SMDE     : READ TIMING SELECT (H: ESG SETTING INVALID/L: ESG INPUT EFFECTIVE)
STDBY    : STANDBY (H: NORMAL/L: INTERNAL CLOCK SUPPLY STOP)
STRB     : SHUTTER SPEED SETTING
TEST1 - TEST8 : TEST
TRIG     : EXTERNAL TRIGGER
VD       : VERTICAL SYNC
XGRST    : INTERNAL FF RESET (L: RESET)

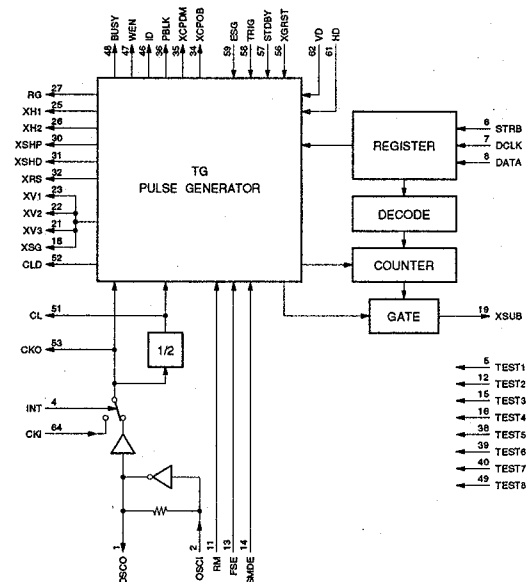
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OUTPUT

```

CKO      : 9232H CLOCK
CL       : 1616H CLOCK
CLD      : AD CONVERSION PULSE
BUSY     : TRIGGER MODE FLAG
ID       : LINE DETECT
OSCO     : OSCILLATOR INVERTER
PBLK     : BLANKING CLEANING PULSE
RG       : RESET GATE PULSE
WEN      : WRITE ENABLE
XCPDM    : CLAMP PULSE
XCPOB    : CLAMP PULSE
XH1, XH2 : CCD HORIZONTAL DRIVE CLOCK
XRS      : SAMPLE HOLD PULSE
XSG      : CCD SENSOR ELECTRIC READ OUT PULSE
XSHD     : SAMPLE HOLD PULSE
XSHP     : SAMPLE HOLD PULSE
XSUB     : CCD ELECTRIC SWEEP THROW AWAY PULSE
XV1 - XV3 : CCD VERTICAL DRIVE CLOCK

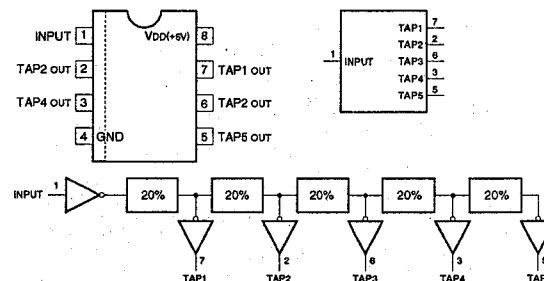
```



DS1000Z-50 (DALLAS SEMICONDUCTOR)
DS1000Z-75(TE2) (DALLAS SEMICONDUCTOR)
DS1000Z-50(TE2)

C-MOS DELAY LINE

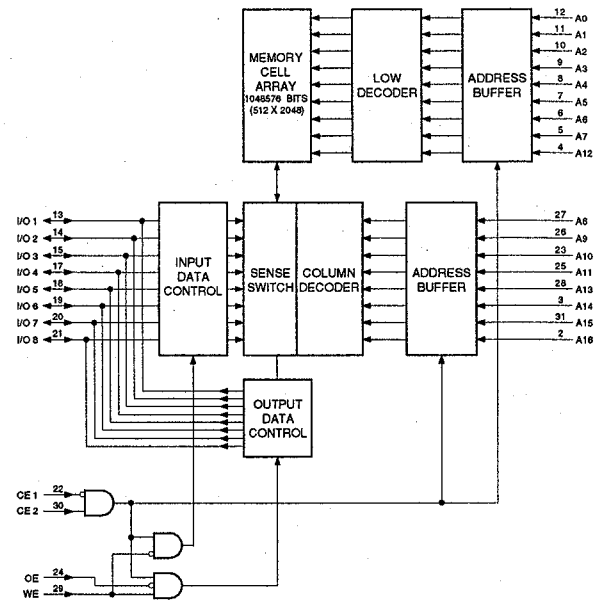
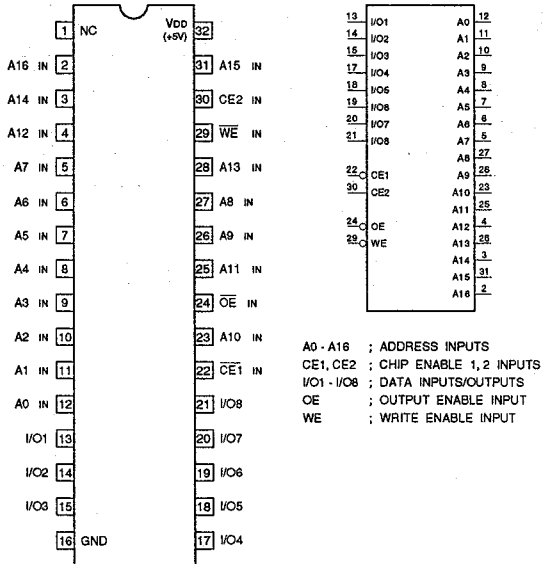
-TOP VIEW-



TYPE. NO.	DELAY TIME (ns)				
	TAP1	TAP2	TAP3	TAP4	TAP5
DS1000M-50	10	20	30	40	50
DS1000M-80	12	24	36	48	60
DS1000M-75	15	30	45	60	75
DS1000M-100	20	40	60	80	100
DS1000M-125	25	50	75	100	125
DS1000M-150	30	60	90	120	150
DS1000M-175	35	70	105	140	175
DS1000M-200	40	80	120	160	200
DS1000M-250	50	100	150	200	250
DS1000M-500	100	200	300	400	500
DS1000Z-25	5	10	15	20	25
DS1000Z-100	20	40	60	80	100

CXK581000AM-70LL (SONY) FLAT PACKAGE
CXK581000AM-70LL-TL

C-MOS 1M (131,072 x 8) -BIT STATIC RAM
—TOP VIEW—



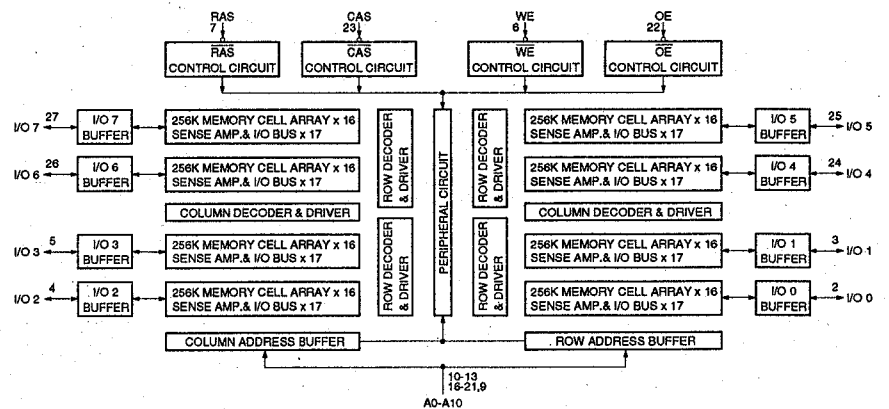
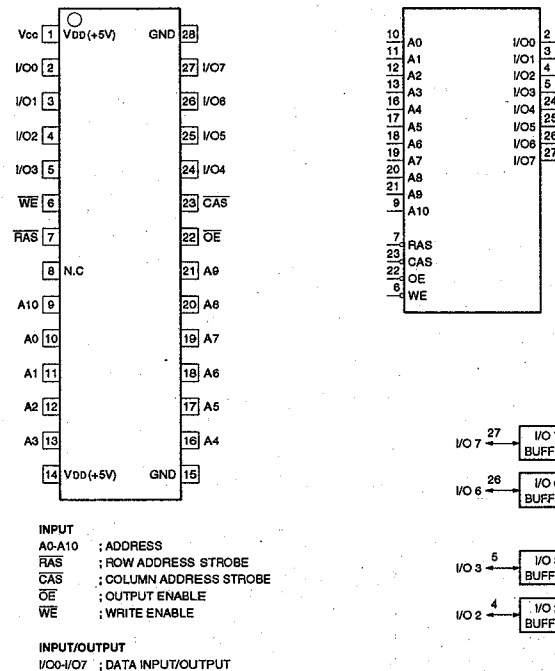
MODE:

CE1	CE2	OE	WE	MODE	DATA OUTPUT
1	X	X	X	NO SELECTION	
X	0	X	X	(POWER DOWN)	HI-Z
0	1	1	1	OUTPUT DISABLE	
0	1	0	1	READ	D OUT
0	1	X	0	WRITE	D IN

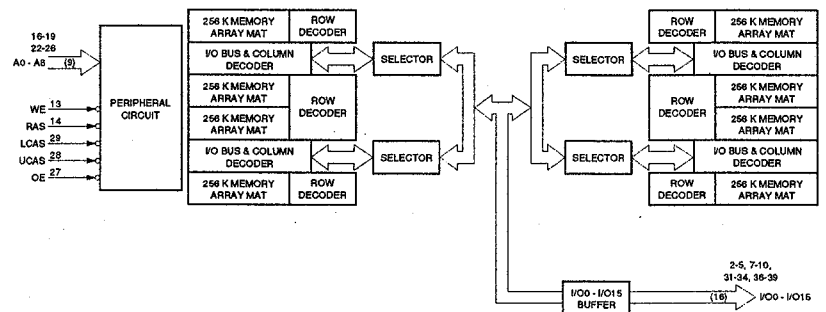
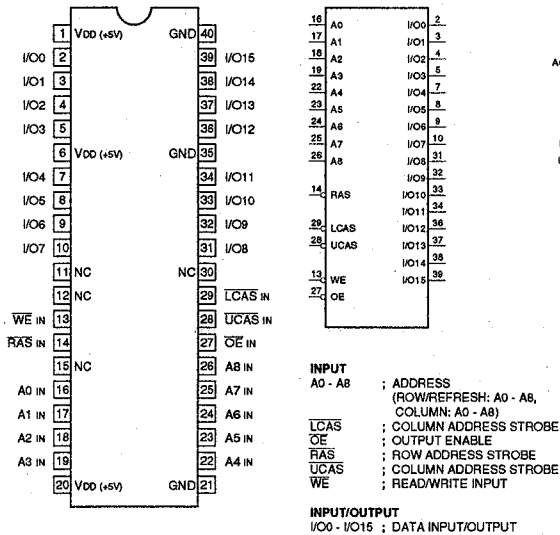
0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE
HI-Z : HIGH IMPEDANCE

HM5117800BJ-7EL (HITACHI)

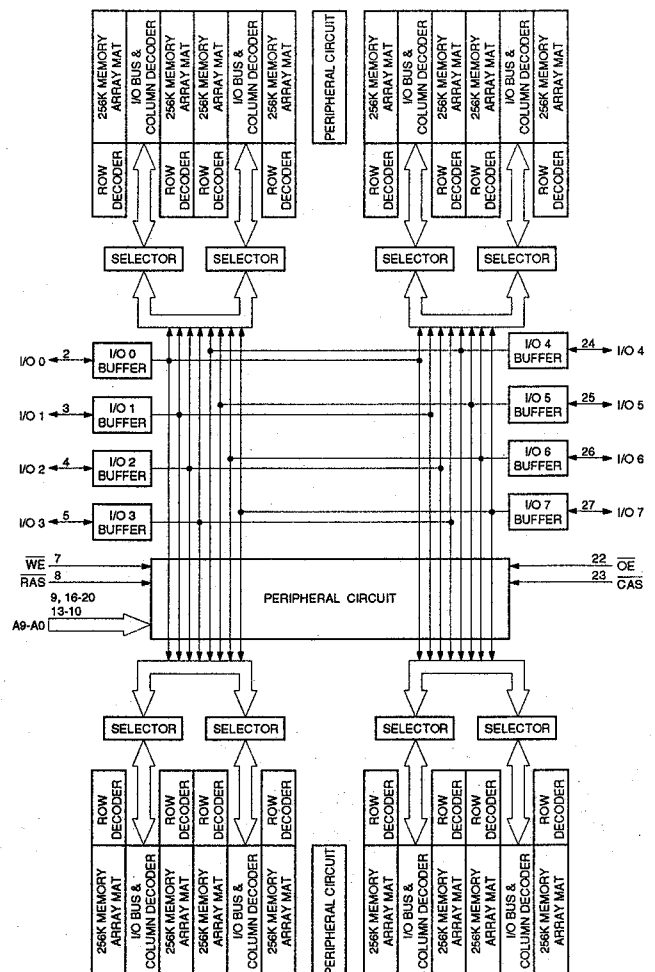
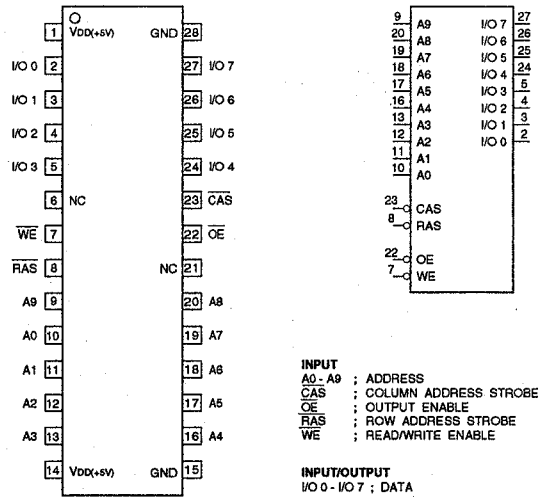
C-MOS 2,097,152-WORD x 8-BIT DYNAMIC RAM
—TOP VIEW—



HM514260CJ7-Z (HITACHI)

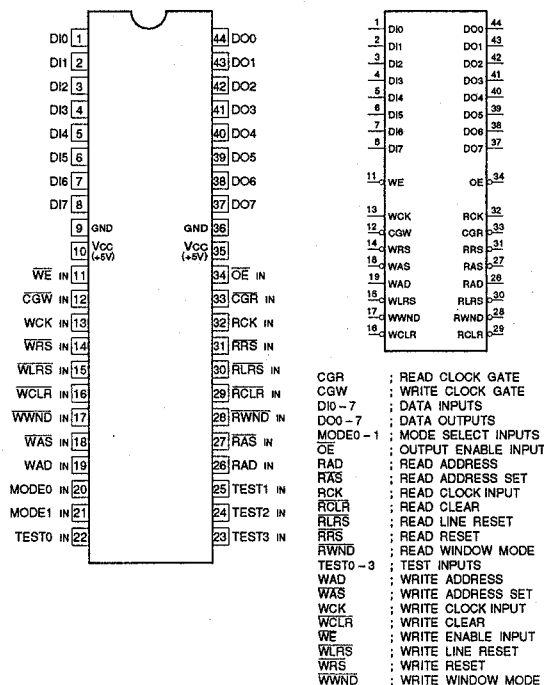
C-MOS 4M(262, 144WX16) -BIT DYNAMIC RAM
— TOP VIEW —

HM514800CJ7Z (HITACHI) FLAT PACKAGE

C-MOS 524288-WORD x 8-BIT DYNAMIC RAM
—TOP VIEW—

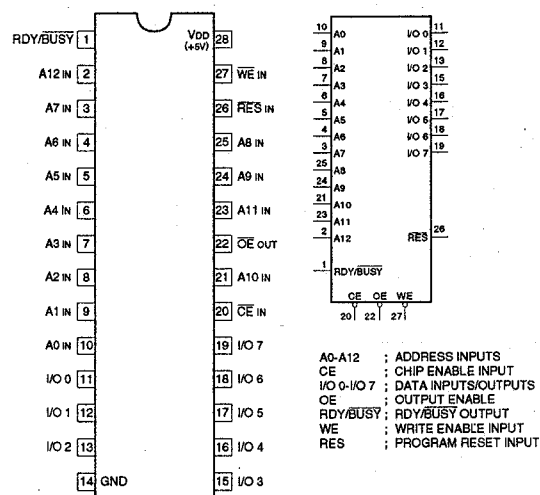
HM530281-20 (HITACHI) FLAT PACKAGE HM530281RTT-20

331,776WORDX8-BIT FRAME MEMORY
-TOP VIEW-



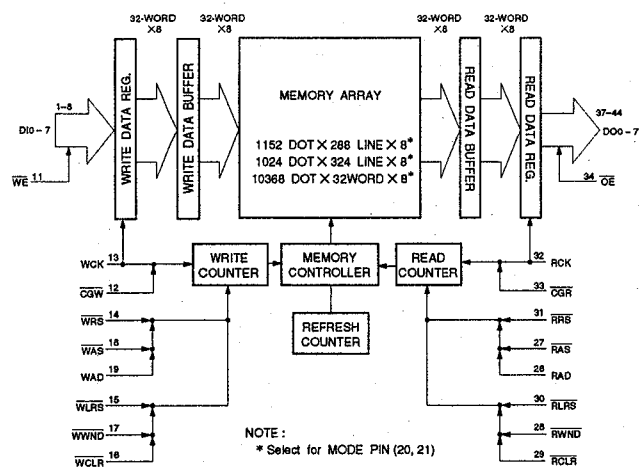
HN58C66FP-25 (HITACHI)

C-MOS 64K (8192 X 8)-BIT EEPROM
-TOP VIEW-



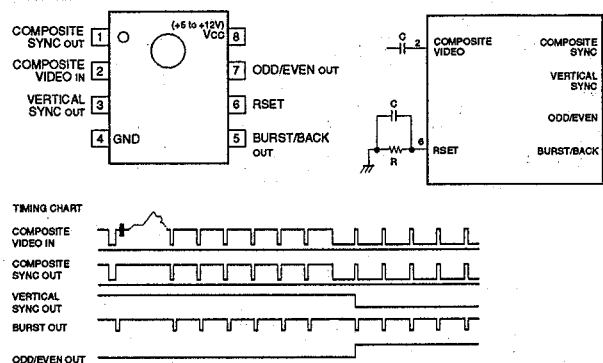
CE	OE	WE	RDY/BUSY	RES	I/O TERMINAL	FUNCTION
0	0	1	HI-Z	1	Dout	READ
1	X	X	HI-Z	X	HI-Z	STANDBY
0	1	0	HI-Z-LOW	1	Din	WRITE
0	1	1	HI-Z	1	HI-ZL	DESELECT
X	X	1	HI-Z	X	—	WRITE INH
X	0	X	HI-Z	X	—	WRITE INH
0	0	1	LOW	1	DATA OUT (1/07)	DATA POLLING
X	X	X	HI-Z	0	HI-Z	PROGRAM RESET

0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE
HI-Z : HIGH IMPEDANCE



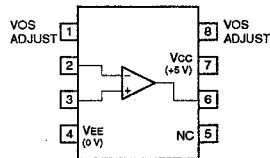
LM1881M (NS) FLAT PACKAGE

VIDEO SYNC SEPARATOR
-TOP VIEW-



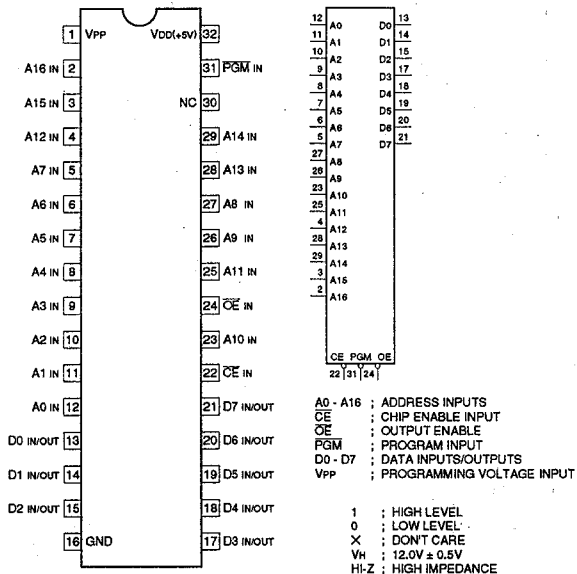
LM6361M (NEC)
LM6361M-T1

HIGH SPEED OPERATIONAL AMPLIFIER
—TOP VIEW—

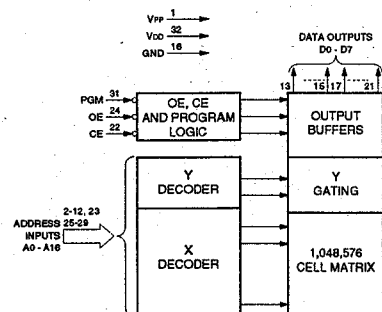


M27C1001-10F1 (SGS)

C-MOS 1M (128K X 8)-BIT UV EPROM
—TOP VIEW—

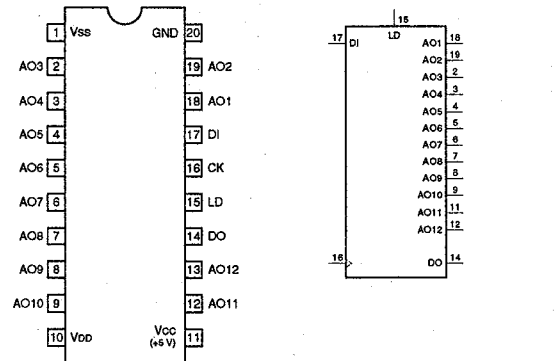


MODE	CE	OE	A9	PGM	VPP	OUTPUT
READ	0	0	X	X	X	DO OUT
OUTPUT DISABLE	0	1	X	X	X	HI-Z
STANDBY	1	X	X	X	X	HI-Z
PROGRAM	0	1	X	0	VPP	DIN
PROGRAM VERIFY	0	0	X	1	VPP	DO OUT
PROGRAM INHIBIT	1	X	X	X	VPP	HI-Z
ELECTRONIC SIGNATURE	0	0	VH	1	VPP	CODE



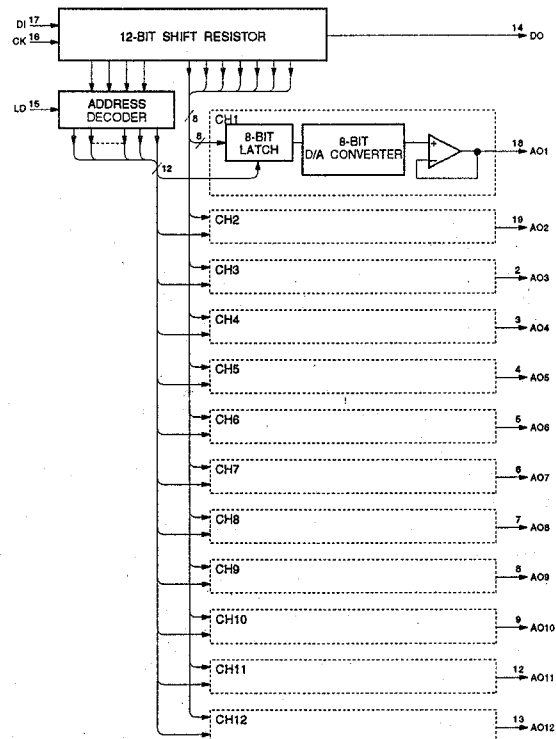
M62352GP (MITSUBISHI) FLAT PACKAGE
M62352GP-75ED

C-MOS 8-BIT X 12 CHANNEL D/A CONVERTER
(WITH BUFFER OPERATIONAL AMPLIFIER)
—TOP VIEW—



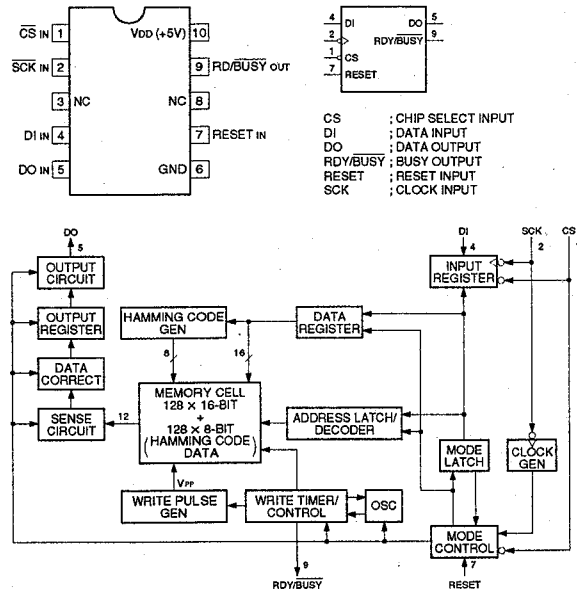
AO1-AO12 : 8-BIT D/A OUTPUTS
CK : CLOCK INPUT
DI : SERIAL DATA INPUT
DO : DATA OUTPUT

NOTE:
3.5 V < VDD < VCC
-3.5 V < VSS < VCC



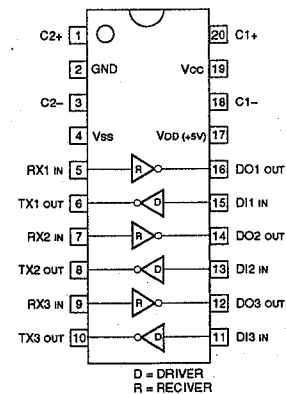
M6M80021FP (MITSUBISHI) FLAT PACKAGE
M6M80021FP-T3

C-MOS 2K (128 x 16) BIT ERASABLE PROM
-TOP VIEW-



MC145407F (MOTOROLA) FLAT PACKAGE
MC145407F-ML2

C-MOS RS-232C DRIVER/RECEIVER
-TOP VIEW-



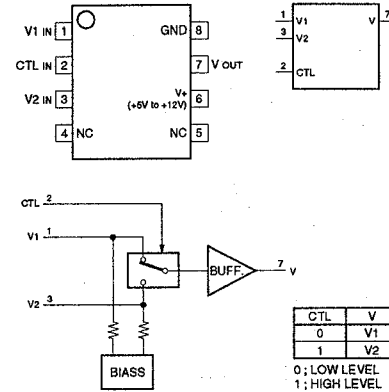
INPUT
DI1 - DI3 : RS-232C DRIVER INPUTS
RX1 - RX3 : RECEIVER INPUTS

OUTPUT
DO1 - DO3 : RS-232C DRIVER OUTPUTS
TX1 - TX3 : TRANSCIEVER OUTPUTS

OTHER
C1+, C1-, C2+, C2- : EXTERNAL CAPACITORS
VDD : POSITIVE SUPPLY
VSS : NEGATIVE SUPPLY

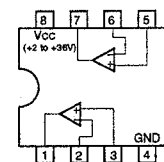
NJM2233BM (JRC) FLAT PACKAGE
NJM2233BM(TE2)

2-INPUT VIDEO SIGNAL SWITCH
-TOP VIEW-



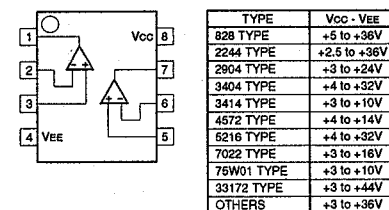
NJM2903M (JRC) FLAT PACKAGE
NJM2903M-TE2

DUAL VOLTAGE COMPARATORS
-TOP VIEW-



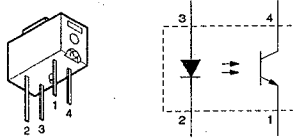
OP293-S (ANALOG DEVICES)

DUAL OPERATIONAL AMPLIFIERS
(SINGLE-SUPPLY TYPE)
-TOP VIEW-



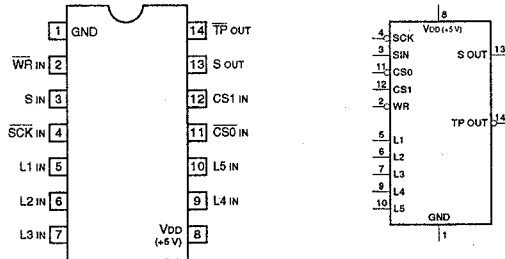
RPI-1020 (ROHM)

OPTICAL DETECTION SENSOR
THAT HAS DETECTION ANGLE



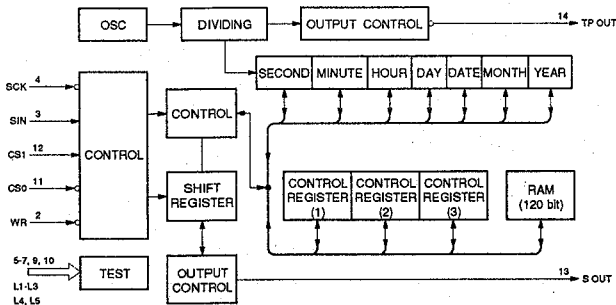
RTC-4553B (EPSON)
RTC-4553B-L2

C-MOS REAL TIME CLOCK
- TOP VIEW -



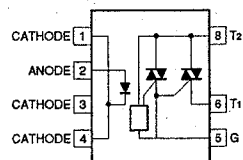
INPUT
CS0 : CHIP SELECT (L: ACCESS ENABLE, H: SOUT HIGH Z)
CS1 : POWER DOWN DETECTION
L1-L5 : TEST IN
SCK : SERIAL SYNC SIGNAL
SIN : SERIAL ADDRESS/DATA
WR : WRITING SELECT (L: WRITING, H: READING)

OUTPUT
SOUT : SERIAL ADDRESS/DATA
TPOUT : REFERENCE SIGNAL



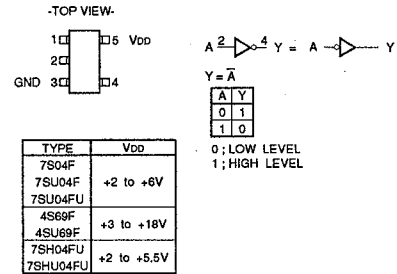
S16MD01 (SHARP)

SOLID STATE RELAY
-TOP VIEW-



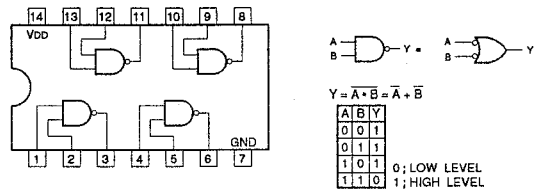
SC7S04F (MOTOROLA)CHIP PACKAGE
TC7S04F(TE85R)

C-MOS INVERTER



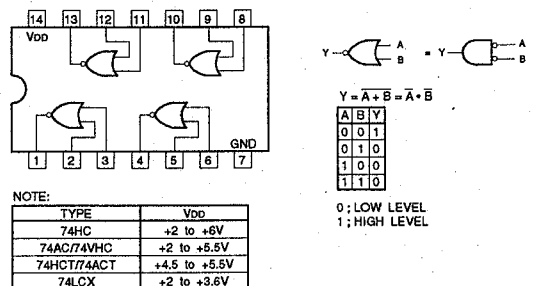
SN74HC00ANS (TI)FLAT PACKAGE
TC74VHC00F (TOSHIBA)FLAT PACKAGE
SN74HC00ANS-E05
TC74VHC00F(EL)

C-MOS QUAD 2-INPUT NAND GATES
-TOP VIEW-



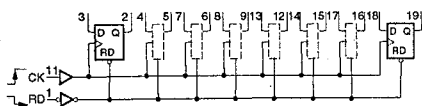
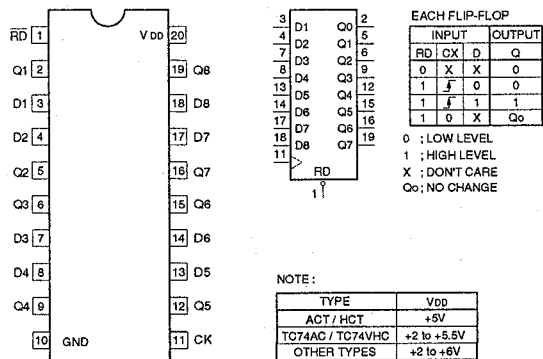
SN74HC02ANS (TI)FLAT PACKAGE
TC74VHC02F (TOSHIBA)FLAT PACKAGE
SN74HC02ANS-E05
TC74VHC02F(EL)

C-MOS QUAD 2-INPUT NOR GATES
-TOP VIEW-



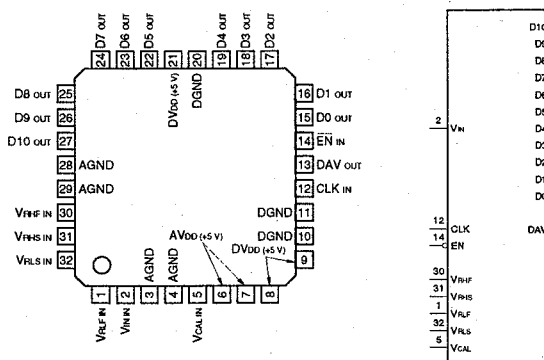
SN74HC273ANS-E05 (TI) FLAT PACKAGE

C-MOS OCTAL D-TYPE FLIP-FLOPS WITH RESET
- TOP VIEW -



SPT7855SCT (SIGNAL PROCESSING TECHNOLOGIES) FLAT PACKAGE

C-MOS 10-BIT A/D CONVERTER
- TOP VIEW -



INPUT

- CLK : CLOCK fCLK = 1s
- EN : OUTPUT ENABLE
- Vcal : CALIBRATION REFERENCE
- Vin : ANALOG VOLTAGE
- Vrhf : REFERENCE HIGH FORCE
- Vrhis : REFERENCE HIGH SENSE
- Vrlf : REFERENCE LOW FORCE
- Vrls : REFERENCE LOW SENSE

OUTPUT

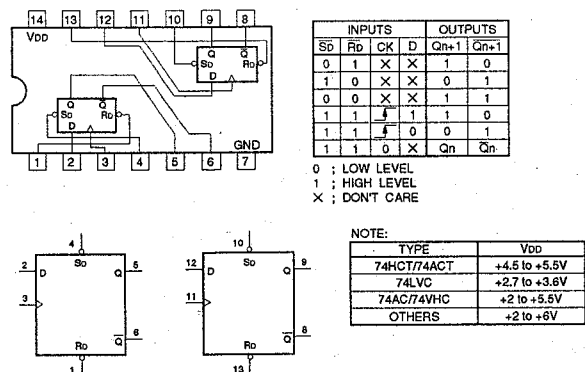
- D0 - D9 : DIGITAL DATA
- D10 : OVERRANGE
- DAV : DATA VALID

OTHER

- AGND : ANALOG GROUND
- AVDD : ANALOG POWER SUPPLY
- DGND : DIGITAL GROUND
- DVDD : DIGITAL POWER SUPPLY

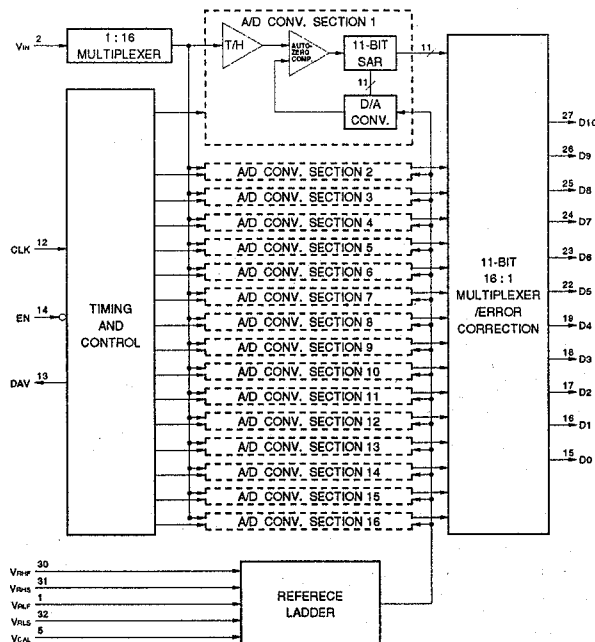
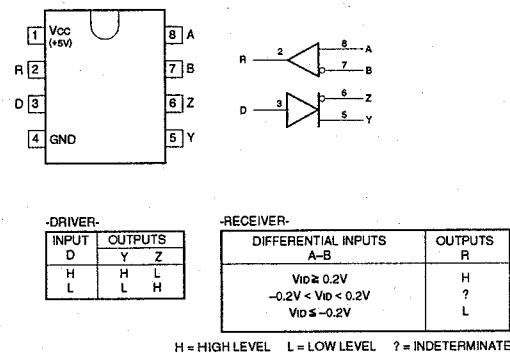
SN74HC74ANS (TI) FLAT PACKAGE TC74VHC74F(EL) SN74HC74ANS-E05

C-MOS DUAL D-TYPE FLIP-FLOPS WITH DIRECT SET/RESET
- TOP VIEW -

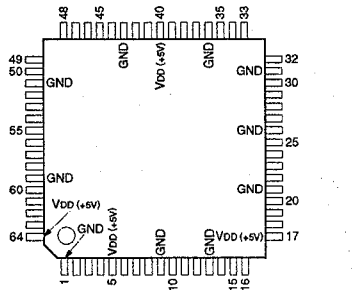


SN75179BPS (TI) FLAT PACKAGE SN75179BPS-E05

DIFFERENTIAL BUS DRIVER/RECEIVER
- TOP VIEW -



SYM53CF92A-64QFP (SYMBIOS LOGIC)

C-MOS SCSI PROTOCOL CONTROLLER
-TOP VIEW-

(VDD = +5V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	—	GND	14	I/O	DB6	27	I/O	SD7	40	—	VDD	53	I	A3-ALE	66	I	TESTIN
2	O	DREQ	15	I/O	DB7	28	I/O	SDP	41	I	MODE	54	I	TESTIN	67	I	SDP
3	I	DACK	16	I/O	DBP	29	I/O	ATN	42	O	INT	55	I/O	PAD0	68	I	MSG
4	I	DBWR	17	—	VDD	30	I/O	BSY	43	—	GND	56	I/O	PAD1	69	I	RST
5	—	VDD	18	I/O	SD0	31	—	GND	44	I	RESET	57	I/O	PAD2	70	I	ACK
6	I/O	DB0	19	I/O	SD1	32	I/O	ACK	45	I	WR	58	I/O	PAD3	71	—	GND
7	I/O	DB1	20	I/O	SD2	33	I/O	RST	46	I	RD	59	—	GND	72	I	BSY
8	I/O	DB2	21	—	GND	34	I/O	MSG	47	I	CS	60	I/O	PAD4	73	I	ATN
9	—	GND	22	I/O	SD3	35	I/O	SEL	48	I	CLK	61	I/O	PAD5	74	I	SDP
10	I/O	DB3	23	I/O	SD4	36	—	GND	49	I	A0	62	I/O	PAD6	75	I	SDP
11	I/O	DB4	24	I/O	SD5	37	I/O	CD	50	I	A1	63	I/O	PAD7	76	I	SDP
12	I/O	DB5	25	I/O	SD6	38	I/O	REQ	51	—	GND	64	—	VDD	77	I	SDP
13	—	GND	26	—	GND	39	I/O	IO	52	I	A2-DBRD	65	—	VDD	78	I	SDP

INPUT

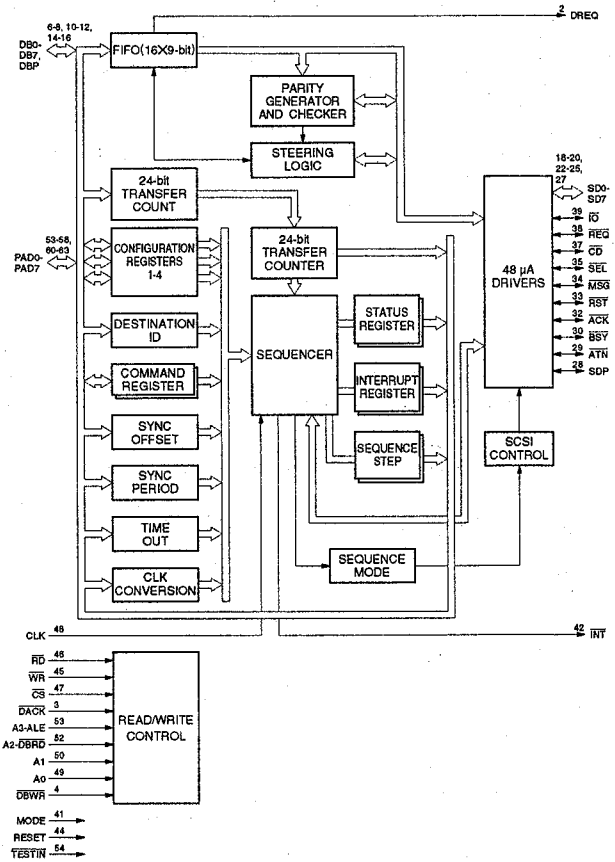
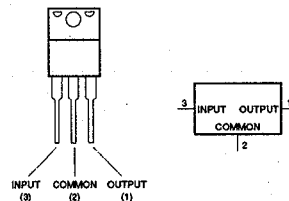
A0, A1 : ADDRESS
A2-DBRD : ADDRESS/READ SIGNAL FOR THE DMA DATA BUS
A3-ALE : ADDRESS
CLK : CLOCK
CS : CHIP SELECT
DACK : DMA ACKNOWLEDGE
DBWR : DMA WRITE SIGNAL
MODE : MODE SELECT (PAD BUS/ADDRESS CONTROL BUS)
RD : REGISTER READ SIGNAL
RESET : CHIP RESET
TESTIN : TEST
WR : REGISTER WRITE SIGNAL

OUTPUT

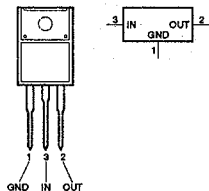
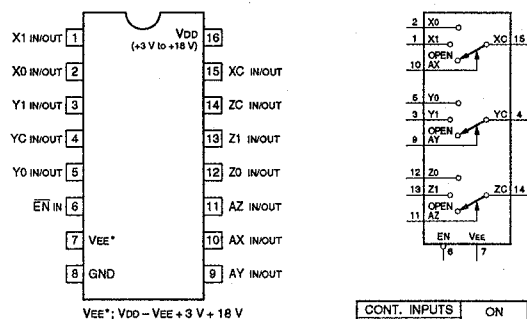
DREQ : DMA REQUEST SIGNAL
INT : OPEN-DRAIN INTERRUPT SIGNAL

INPUT/OUTPUT

ACK : SCSI I/O
ATN : OPEN-DRAIN OUTPUT, SCHMITT TRIGGER INPUT
BSY : OPEN-DRAIN SCSI I/O
CD : SCSI PHASE SIGNAL
DB0-DB7 : DMA DATA BUS
DBP : ODD PARITY FOR DB0-DB7
IO : SCSI PHASE SIGNAL
MSG : SCSI PHASE SIGNAL
PAD0-PAD7 : PROCESSOR ADDRESS-DATA BUS
REQ : SCSI I/O
RST : OPEN-DRAIN SCSI I/O
SD0-SD7 : SCSI DATA BUS
SDP : SCSI DATA/PARITY OUTPUT BUS
SEL : OPEN-DRAIN SCSI I/O

TA7805S (TOSHIBA)+5V(1 A)
AN7805POSITIVE VOLTAGE REGULATOR
—FRONT VIEW—

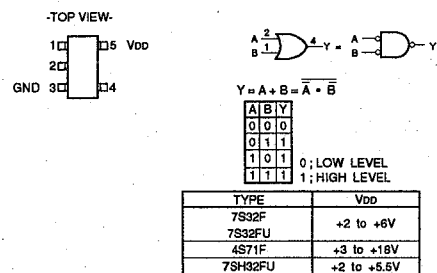
TA79005S (TOSHIBA)—5V

NEGATIVE VOLTAGE REGULATOR (500mA)
—TOP VIEW—TC4053BFS (TOSHIBA) FLAT PACKAGE
TC4053BFS-ELC-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXERS/DEMULTIPLEXERS
—TOP VIEW—0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE

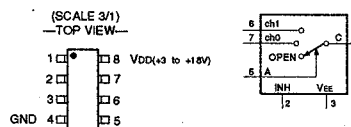
CONT. INPUTS	ON CHANNEL
EN A (X, Y, Z)	
0 0 0	0
0 0 1	1
1 X X	OPEN

TC4S71F (TOSHIBA) CHIP PACKAGE
TC4S71F (TE85R)

C-MOS 2-INPUT OR GATE

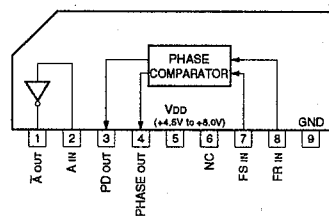
TC4W53FU (TOSHIBA) CHIP PACKAGE
TC4W53FU (TE12R)

C-MOS 2-CHANNEL MULTIPLEXER / DEMULTIPLEXER

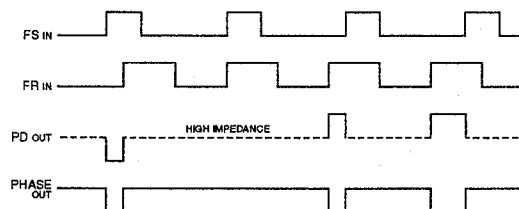
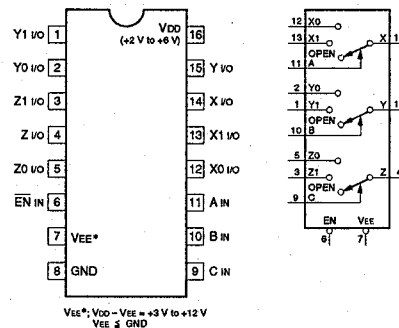


CONT. INPUT	ON CHANNEL
INH A	
0 0	ch0
0 1	ch1
1 X	OPEN

TC5081AP (TOSHIBA)

C-MOS PHASE COMPARATOR
—SIDE VIEW—

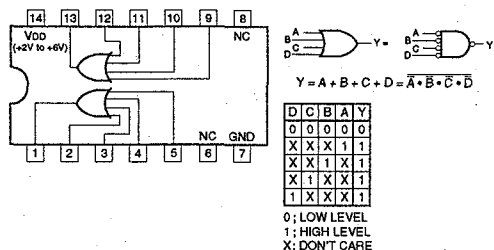
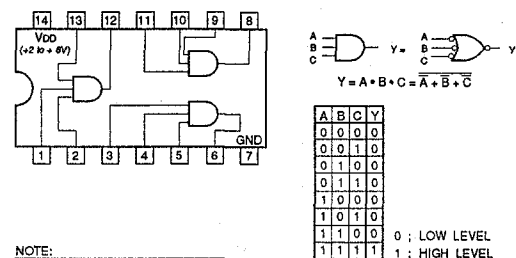
PHASE COMPARATOR TIMING CHART

TC74HC4053AFS (TOSHIBA) FLAT PACKAGE
TC74HC4053AFS-ELC-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
—TOP VIEW—

CONTROL INPUTS	ON CHANNEL
EN SELECT C B A	
0 0 0 0	Z0 Y0 X0
0 0 0 1	Z0 Y0 X1
0 0 1 0	Z0 Y1 X0
0 0 1 1	Z0 Y1 X1
0 1 0 0	Z1 Y0 X0
0 1 0 1	Z1 Y0 X1
0 1 1 0	Z1 Y1 X0
0 1 1 1	Z1 Y1 X1
1 X X X	OPEN

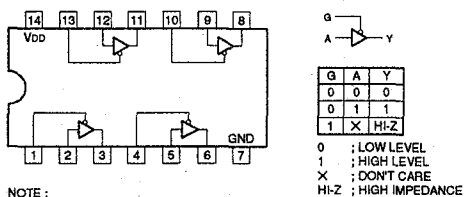
0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE

TC74HC4072AF (TOSHIBA) FLAT PACKAGE

C-MOS 4-INPUT OR GATE
—TOP VIEW—TC74VHC11F (TOSHIBA) FLAT PACKAGE
TC74VHC11F(EL)C-MOS 3-INPUT POSITIVE-AND GATE
—TOP VIEW—

NOTE:

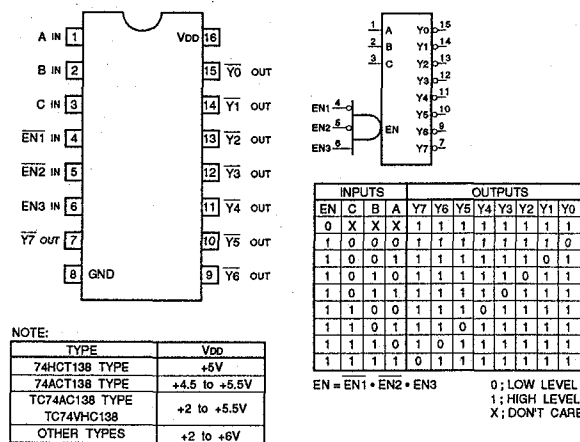
TYPE	VDD
TC74VHC11	+2V to +5.5V
OTHER TYPES	+2V to +6V

TC74VHC125F (TOSHIBA) FLAT PACKAGE
TC74VHC125F(EL)C-MOS BUS BUFFER GATES WITH 3-STATE OUTPUT
—TOP VIEW—

NOTE:

TYPE	VDD
74AC/74VHC	+2 to +5.5V
74ACT/74HCT	+4.5 to +5.5V
74LCX	+2 to +3.6V
74LVT/74LVC	+2.7 to +3.6V
OTHER TYPES	+2 to +6V

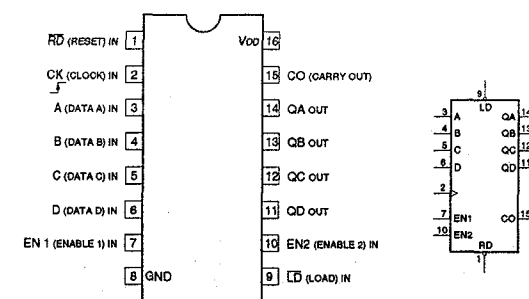
TC74VHC138F(EL) (TOSHIBA)

C-MOS 3-TO-8 LINE DECODER / DEMULTIPLEXER
—TOP VIEW—

NOTE:

TYPE	VDD
74HCT138 TYPE	+5V
74ACT138 TYPE	+4.5 to +5.5V
TC74AC138 TYPE	+2 to +5.5V
TC74VHC138	+2 to +5.5V
OTHER TYPES	+2 to +6V

TC74VHC161F(EL) (TOSHIBA)

C-MOS SYNCHRONOUS PRESETTABLE 4-BIT BINARY COUNTER
—TOP VIEW—

MODE SELECTION

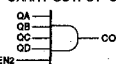
MODE SELECTION				MODE
Rd	LD	EN1	EN2	
0	X	X	X	RESET (ASYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

0; LOW LEVEL

1; HIGH LEVEL

X; DON'T CARE

CARRY OUTPUT "CO"



CO IS HIGH WHEN EN2 INPUT IS HIGH AND COUNT IS "15".

NOTE:

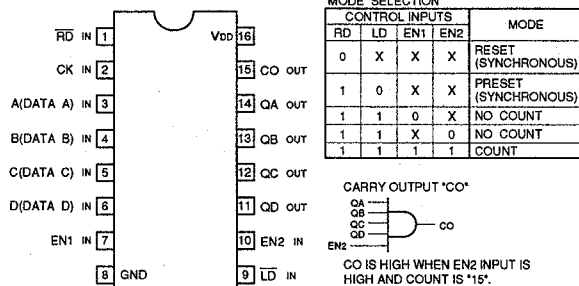
TYPE	VDD
74ACT	+5 V
TC40H	+2 to +8 V
OTHERS	+2 to +6 V

COUNT SEQUENCE

COUNT	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

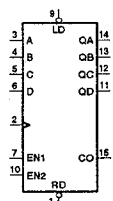
TC74VHC163F (TOSHIBA) FLAT PACKAGE TC74VHC163F(EL)

C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER
—TOP VIEW—



NOTE:

TYPE	V _{DD}
HC	+2 to +6V
AC/HVC	+2 to +5.5V
HCT/ACT/FCT	+5V

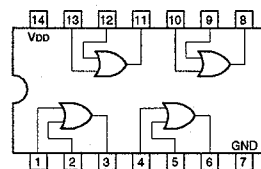


COUNT SEQUENCE

COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

TC74VHC32F(EL) (TOSHIBA)

C-MOS QUAD 2-INPUT OR GATES
—TOP VIEW—



NOTE:

TYPE	V _{DD}
74AC/74VHC	+2 to +5.5V
74HC	+2 to +6V
74HCT	+4.5 to +5.5V

$$A \text{ OR } B = Y = A + B$$

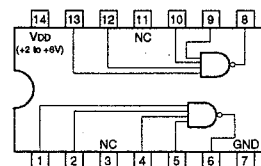
$$Y = A + B = \overline{A \cdot B}$$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

0: LOW LEVEL
1: HIGH LEVEL

TC74VHC20F(EL) (TOSHIBA) FLAT PACKAGE

C-MOS 4-INPUT POSITIVE-NAND GATE
—TOP VIEW—



NOTE:

TYPE	V _{DD}
AC/HVC	+2 to +5.5V
HC	+2 to +6V

$$A \text{ NAND } B \text{ NAND } C \text{ NAND } D = Y = \overline{A \cdot B \cdot C \cdot D}$$

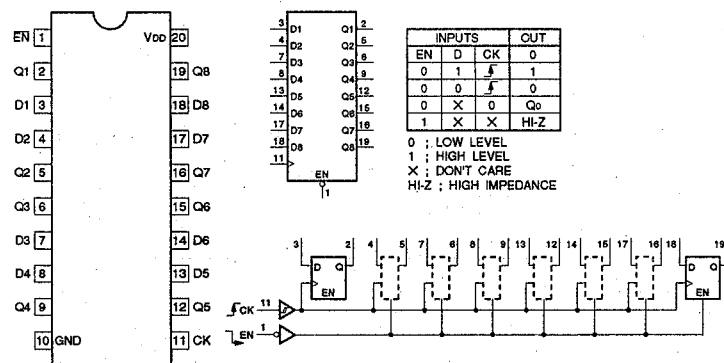
$$Y = \overline{A \cdot B \cdot C \cdot D} = \overline{A} + \overline{B} + \overline{C} + \overline{D}$$

A	B	C	D	Y
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

0: LOW LEVEL
1: HIGH LEVEL

TC74VHC374F (TOSHIBA) FLAT PACKAGE TC74VHC374F(EL)

C-MOS 3-STATE OCTAL D-TYPE FLIP-FLOP
—TOP VIEW—

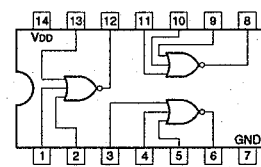


NOTE:

TYPE	V _{DD}
74AC/74HC	+2 to +6V
74ACT/74BCT/74FCT	+5V
74HCT	+5V
74VHC	+2 to +5.5V

TC74VHC27F(EL) (TOSHIBA)

C-MOS 3-LINE POSITIVE-NOR GATE
—TOP VIEW—



NOTE:

TYPE	V _{DD}
TC40H	+2 to +8V
OTHERS	+2 to +6V

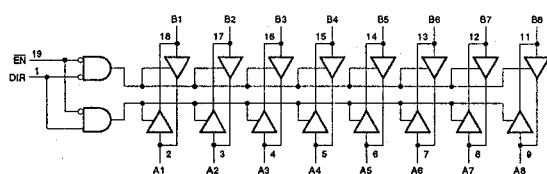
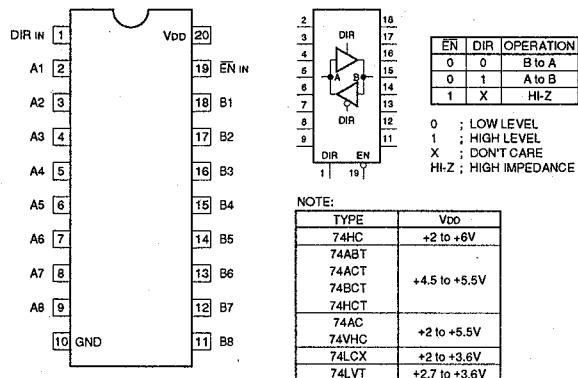
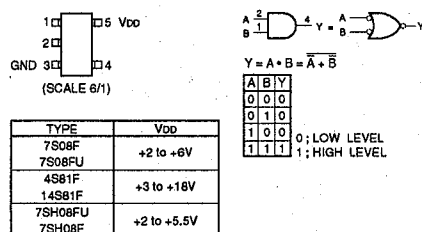
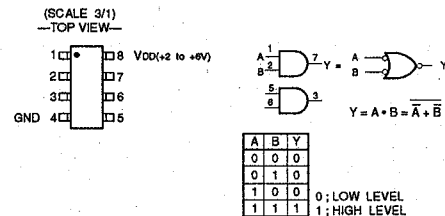
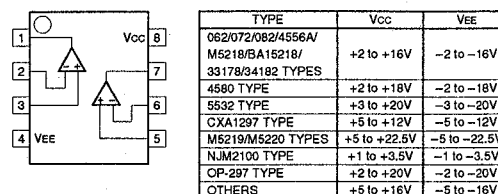
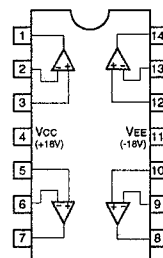
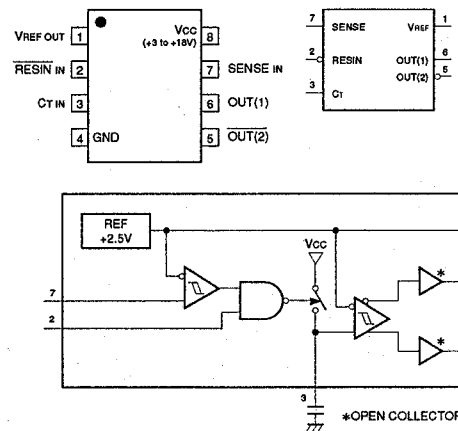
$$A \text{ NOR } B \text{ NOR } C = Y = \overline{A + B + C}$$

$$Y = \overline{A + B + C} = \overline{A} \cdot \overline{B} \cdot \overline{C}$$

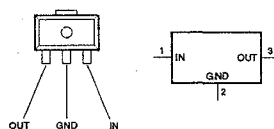
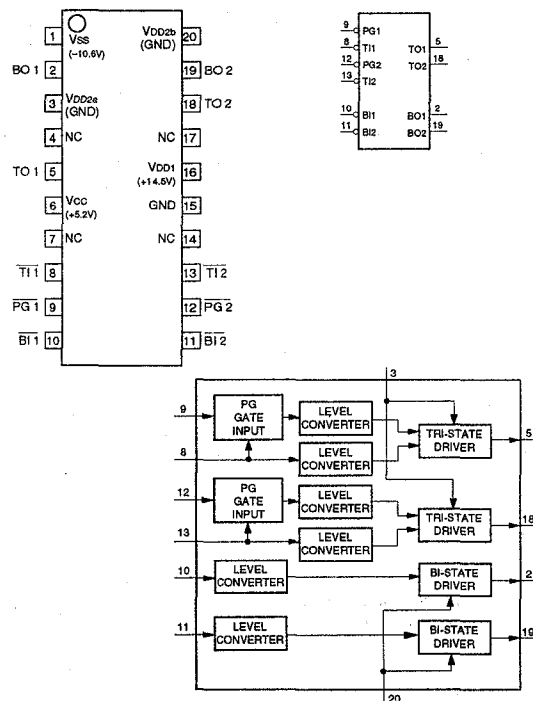
A	B	C	Y
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

0: LOW LEVEL
1: HIGH LEVEL

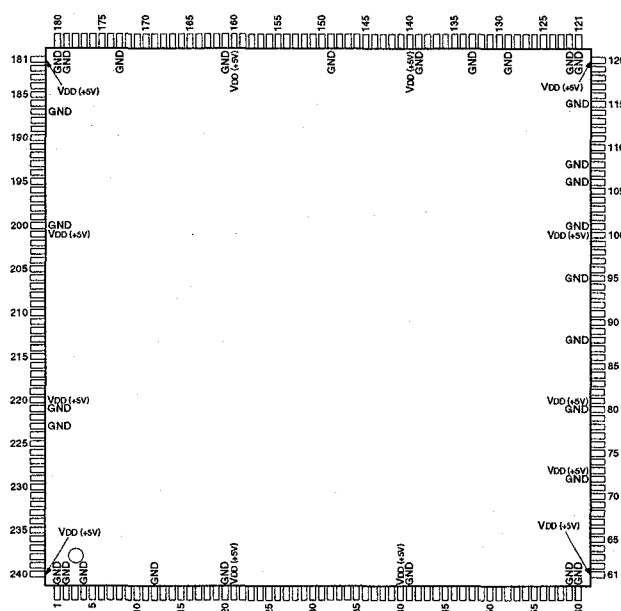
TC74VHCT245F(EL) (TOSHIBA) FLAT PACKAGE

C-MOS BILATERAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS
-TOP VIEW-TC7S08F (TOSHIBA) CHIP PACKAGE
TC7S08F(TE85R)C-MOS 2-INPUT AND GATE
-TOP VIEW-TC7W08F (TOSHIBA) CHIP PACKAGE
TC7W08F(TE12R)C-MOS 2-INPUT AND GATE
(SCALE 3/1)
-TOP VIEW-TL062CPW (TI) FLAT PACKAGE
TL082M (TI) FLAT PACKAGE
TL062CPW-E05
TL082CPS-E20DUAL OPERATIONAL AMPLIFIERS
(DUAL-SUPPLY TYPE)
-TOP VIEW-TL064CPW (TI) FLAT PACKAGE
TL064CPW-E05OPERATIONAL AMPLIFIER
(J FET INPUT)
-TOP VIEW-TL7705ACPS (TI) FLAT PACKAGE
TL7705CPS-B (TI) FLAT PACKAGE
TL7705ACPS-E05
TL7705CPS-B-E20POWER VOLTAGE SUPERVISOR
-TOP VIEW-

UPC78L08T-E1 (NEC)+8V

POSITIVE VOLTAGE REGULATOR
-TOP VIEW-UPD16502GS(1) (NEC) FLAT PACKAGE
UPD16502GS(1)-E2C-MOS CCD DRIVER
-TOP VIEW-

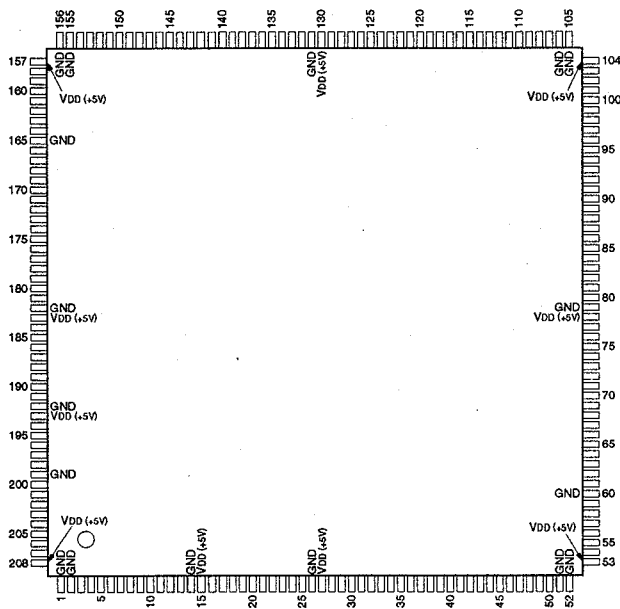
UPD65808GN-056-LMU (NEC)

C-MOS GATE ARRAY
-TOP VIEW-

(VDD = +5V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	—	GND	49	I	MB7	97	I/O	ID1	145	O	AD9	193	I	XLUTCS
2	—	GND	50	O	XOE0	98	I/O	ID2	146	I/O	DB1	194	I	XWE
3	I/O	XACK21	51	O	XCGRO	99	I/O	ID3	147	I/O	DB0	195	I	XRE
4	—	GND	52	O	XCEE	100	—	VDD	148	I/O	DG7	196	O	XWAT
5	I/O	XRCQ21	53	O	XCGRE	101	—	GND	149	—	GND	197	O	XINT
6	I/O	B217	54	O	XRRS	102	I/O	ID4	150	I/O	DG6	198	I/O	CPD3
7	I/O	B216	55	O	XRLRS	103	I/O	ID5	151	I/O	DG5	199	I/O	CPD2
8	I/O	B215	56	I/O	G216	104	I/O	ID6	152	I/O	DG4	200	—	GND
9	O	MRO0	57	I/O	G215	105	I/O	ID7	153	I	CA11	201	—	VDD
10	O	MRO1	58	I/O	G214	106	—	GND	154	I	CA10	202	I/O	CPD1
11	O	MRO2	59	—	GND	107	I	REQ0	155	I	CA9	203	I/O	CPD0
12	—	GND	60	—	GND	108	—	GND	156	I	CA8	204	I	B117
13	O	MRO3	61	—	VDD	109	O	XACK0	157	I	CA7	205	I	B116
14	O	MRO4	62	I/O	G213	110	O	XDMWR	158	I	CA6	206	I	B115
15	O	MRO5	63	I/O	G212	111	O	XDMRE	159	I	CA5	207	I	B114
16	I/O	B214	64	I/O	G211	112	I/O	DB7	160	—	VDD	208	I	B113
17	I/O	B213	65	O	RAD	113	I/O	DB6	161	—	GND	209	I	B112
18	I/O	B212	66	O	XRWND	114	I/O	DB5	162	I	CLK	210	I	B111
19	O	RCK0	67	O	XRASV	115	—	GND	163	I	TST	211	I	B110
20	—	GND	68	O	XRCLR	116	I	XRHD	164	I	XRST	212	I	G117
21	—	VDD	69	O	MGO4	117	I	XRVD	165	I	CA4	213	I	G116
22	I/O	B211	70	O	MGO5	118	I	RFLD	166	I	CA3	214	I	G115
23	I/O	B210	71	O	MGO6	119	I	RCK1	167	I	CA2	215	I	G114
24	I/O	G217	72	—	GND	120	—	VDD	168	I	CA1	216	I	G113
25	I	MR7	73	—	VDD	121	—	GND	169	I	CA0	217	I	G112
26	I	MG0	74	O	MGO7	122	—	GND	170	I/O	DG3	218	I	G111
27	I	MG1	75	O	MBO0	123	O	XCAS	171	I/O	DG2	219	I	G110
28	I	MG2	76	O	MBO1	124	O	XWER	172	I/O	DG1	220	—	VDD
29	I	MG3	77	I/O	G210	125	O	XWEG	173	—	GND	221	—	GND
30	I	MG4	78	I/O	R217	126	O	XWEB	174	I/O	DG0	222	I	XRQ11
31	I	MG5	79	I/O	R216	127	O	XOE	175	I/O	DR7	223	—	GND
32	I	MG6	80	—	GND	128	O	XRAS	176	I/O	DR6	224	O	XACK11
33	I	MG7	81	—	VDD	129	—	GND	177	I/O	CPD7	225	I	R117
34	I	MB0	82	I/O	R215	130	I/O	DB4	178	I/O	CPD6	226	I	R116
35	I	MB1	83	I/O	R214	131	I/O	DB3	179	—	GND	227	I	R115
36	I	MB2	84	I/O	R213	132	I/O	DB2	180	—	GND	228	I	R114
37	O	MRO6	85	O	MBO2	133	—	GND	181	—	VDD	229	I	R113
38	O	MRO7	86	O	MBO3	134	O	AD0	182	I/O	CPD5	230	I	R112
39	O	MGO0	87	O	MBO4	135	O	AD1	183	I/O	CPD4	231	I	R111
40	—	VDD	88	—	GND	136	O	AD2	184	I/O	DR5	232	I	R110
41	—	GND	89	O	MBO5	137	O	AD3	185	I/O	DR4	233	I	MR0
42	O	MGO1	90	O	MBO6	138	O	AD4	186	I/O	DR3	234	I	MR1
43	O	MGO2	91	O	MBO7	139	—	GND	187	—	GND	235	I	MR2
44	O	MGO3	92	I/O	R212	140	—	VDD	188	I/O	DR2	236	I	MR3
45	I	MB3	93	I/O	R211	141	O	AD5	189	I/O	DR1	237	I	MR4
46	I	MB4	94	I/O	R210	142	O	AD6	190	I/O	DR0	238	I	MR5
47	I	MB5	95	—	GND	143	O	AD7	191	I	XC5	239	I	MR6
48	I	MB6	96	I/O	ID0	144	O	AD8	192	I	XLWCS	240	—	VDD

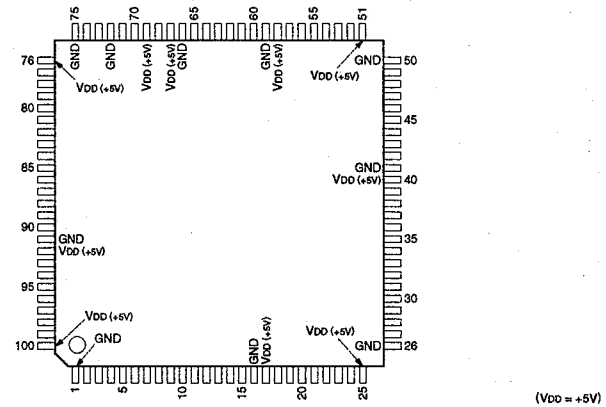
UPD65810GD-047-LML (NEC)

C-MOS GATE ARRAY
-TOP VIEW-

(VDD = +5V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	—	GND	43	O	XCGWE4	85	I	ADR4	127	I	XLUTCS	169	O	DAD2			
2	—	GND	44	O	XWCLR	86	I	ADR5	128	I	XFWCS	170	O	DAD1			
3	I/O	DR5	45	O	MDG6	87	I	ADR6	129	I	XCS	171	O	CA10			
4	I/O	DR4	46	O	MDG5	88	I	ADR7	130	—	VDD	172	I	CA12			
5	I/O	DR3	47	O	MDG4	89	I	ADR8	131	—	GND	173	I	CA11			
6	I/O	CPD1	48	I/O	HVR6	90	I	ADR9	132	I/O	XREQ	174	I	CA10			
7	I/O	CPD0	49	I/O	HVR7	91	I	ADG0	133	I	TST	175	I	CA9			
8	O	MDR4	50	I/O	HVG0	92	I	ADG1	134	I/O	XACK	176	I	CA8			
9	O	MDR3	51	—	GND	93	I	ADG2	135	I	XRST	177	I	CA7			
10	O	MDR2	52	—	GND	94	I	ADG3	136	I/O	HVB5	178	I	CA6			
11	I/O	HVR0	53	—	VDD	95	I	ADG4	137	I/O	HVB6	179	I	CA5			
12	I/O	HVR1	54	I/O	HVG1	96	I	ADG5	138	I/O	HVB7	180	I	CA4			
13	I/O	HVR2	55	I/O	HVG2	97	I	ADG6	139	O	DIR	181	I	CA3			
14	—	GND	56	I/O	HVG3	98	I	ADG7	140	O	XWEB	182	—	GND			
15	—	VDD	57	O	MDG3	99	I	ADG8	141	O	XWEG	183	—	VDD			
16	I/O	HVR3	58	O	MDG2	100	I	ADG9	142	O	XWER	184	I	CA2			
17	I/O	HVR4	59	O	MDG1	101	O	MDB5	143	O	XOE	185	I	CA1			
18	I/O	HVR5	60	—	GND	102	O	MDB4	144	O	XCAS	186	I	CA0			
19	I/O	DR2	61	O	MDG0	103	O	MDB3	145	O	XRAS	187	I/O	CPD7			
20	I/O	DR1	62	O	MDB7	104	—	VDD	146	O	XRFC	188	I/O	CPD6			
21	I/O	DR0	63	O	MDB6	105	—	GND	147	O	XRTC	189	I/O	DG6			
22	O	MDR1	64	O	XWRS	106	—	GND	148	I/O	DB7	190	I/O	DG5			
23	O	MDR0	65	O	XWLRS	107	O	MDB2	149	I/O	DB6	191	I/O	DG4			
24	O	MDG7	66	O	XWWND	108	O	MDB1	150	I/O	DB5	192	—	GND			
25	O	WCK	67	O	XWAS	109	O	MDB0	151	O	DAD10	193	—	VDD			
26	—	GND	68	O	WAD	110	I/O	HVB2	152	O	DAD9	194	I/O	DG3			
27	—	VDD	69	I/O	HVG4	111	I/O	HVB3	153	O	DAD8	195	I/O	DG2			
28	O	XWEO1	70	I/O	HVG5	112	I/O	HVB4	154	O	DAD7	196	I/O	DG1			
29	O	XCGWO1	71	I/O	HVG6	113	I	ADB0	155	—	GND	197	I/O	CPD5			
30	O	XWEE1	72	I	ADR0	114	I	ADB1	156	—	GND	198	I/O	CPD4			
31	O	XCGWE1	73	I	ADR1	115	I	ADB2	157	—	VDD	199	—	GND			
32	O	XWEO2	74	O	CLP	116	I	ADB3	158	O	DAD6	200	I/O	CPD3			
33	O	XCGWO2	75	I	XHD	117	I	ADB4	159	O	DAD5	201	I/O	CPD2			
34	O	XWEE2	76	I	WEN	118	I	ADB5	160	O	DAD4	202	I/O	DG0			
35	O	XCGWE2	77	I	ADCK	119	I	ADB6	161	O	DAD3	203	I/O	DR7			
36	O	XWEO3	78	—	VDD	120	I	ADB7	162	I/O	DB4	204	I/O	DR6			
37	O	XCGWO3	79	—	GND	121	I	ADB8	163	I/O	DB3	205	O	MDR7			
38	O	XWEE3	80	I/O	HVG7	122	I	ADB9	164	I/O	DB2	206	O	MDR6			
39	O	XCGWE3	81	I/O	HVB0	123	O	XINT	165	—	GND	207	O	MDR5			
40	O	XWEO4	82	I/O	HVB1	124	O	XWAT	166	I/O	DB1	208	—	VDD			
41	O	XCGWO4	83	I	ADR2	125	I	XRE	167	I/O	DB0						
42	O	XWEE4	84	I	ADR3	126	I	XWE	168	I/O	DG7						

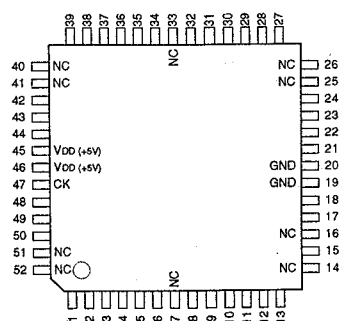
UPD70741GC-25-7EA (NEC)

C-MOS GATE ARRAY
-TOP VIEW-

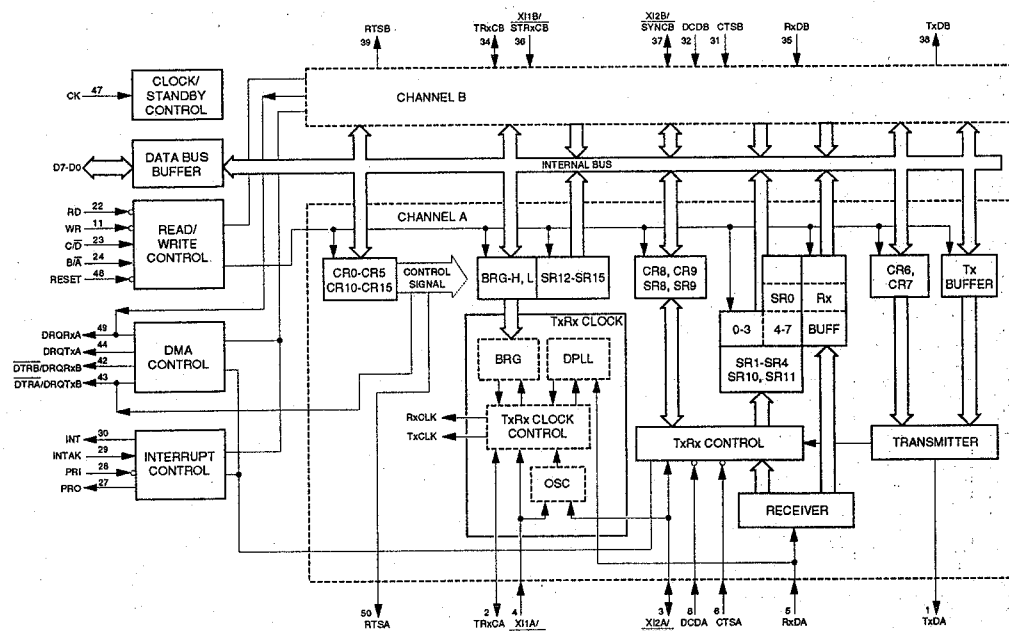
PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	—	GND	21	I/O	INTP02/TC01	41	—	GND	61	O	A7	81	I	READY
2	O	IORD	22	I	INTP01	42	I/O	D8	62	O	A8	82	O	CS0/REFRQ
3	O	IOWR	23	I/O	INTP00/TC00	43	I/O	D9	63	O	A9	83	O	CS1
4	I	NMI	24	I	INTP13/T1	44	I/O	D10	64	O	A10	84	O	CS2
5	I	HLDORG	25	—	VDD	45	I/O	D11	65	O	A11	85	O	CS3
6	O	HLDAR	26	—	GND	46	I/O	D12	66	—	GND	86	O	A12
7	I/O	RVD/P0B/TC	27	I	INTP12	47	I/O	D13	67	—	VDD	87	O	A13
8	I/O	TXD/P0B/TC	28	I	INTP11	48	I/O	D14	68	O	CLKOUT	88	O	A14
9	I/O	SCLK/P07	29	I	INTP10	49	I/O	D15	69	—	VDD	89	O	A15
10	I/O	SO/P06	30	I	RESET	50	—	GND	70	I	X2	90	O	A16
11	I/O	SV/P05	31	—	IC	51	—	VDD	71	I	X1	91	—	GND
12	I/O	DACK1/P04	32	I/O	D0	52	O	A0	72	—	GND	92	—	VDD
13	I/O	DREQ1/P03	33	I/O	D1	53	O	A1	73	O	UCAS	93	O	A17
14	I/O	DACK0/P02	34	I/O	D2	54	O	A2	74	O	LCAS	94	O	A18
15	I/O	DREQ0/P01	35	I/O	D3	55	O	A3	75	—	GND	95	O	A19
16	—	GND	36	I/O	D4	56	O	A4	76	—	VDD	96	O	A20
17	—	VDD	37	I/O	D5	57	O	A5	77	O	RAS	97	O	A21
18	I/O	TCLR/P00	38	I/O	D6	58	—	VDD	78	O	UMWR	98	O	A22
19	O	LOCK	39	I/O	D7	59	—	VDD	79	O	LMWR/WE	99	O	A23
20	I	INTP03	40	—	VDD	60	O	A6	80	O	MWD	100	—	VDD

UPD72001GC-11-3B6 (NEC)

C-MOS ADVANCED MULTI-PROTOCOL SERIAL CONTROLLER
—TOP VIEW—

 $(V_{DD} = +5V)$

PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	O	TxD _A	19	—	GND	37	I/O	X12B/SYNCB
2	I/O	TRF _{CA}	20	—	GND	38	O	TxD _B
3	I/O	X12A/SYNCA	21	I	WR	39	O	RTSB
4	I	X11A/STFXCA	22	I	RD	40	—	NC
5	I	RxD _A	23	I	C/D	41	—	NC
6	I	CTS _A	24	I	B/A	42	O	DTRE/DQTRxB
7	—	NC(OPEN)	25	—	NC	43	O	DTXA/DQRTxB
8	I	DCDA	26	—	NC	44	O	DROTXA
9	I/O	D7	27	O	PRO	45	—	VDD(-5V)
10	I/O	D6	28	I	PRI	46	—	VDD(-5V)
11	I/O	D5	29	I	INTAK	47	I	CK
12	I/O	D4	30	O	INT	48	I	RESET
13	I/O	D3	31	I	CTS _B	49	O	DQCRxA
14	—	NC	32	I	DCDB	50	O	RTSA
15	I/O	D2	33	—	NC(OPEN)	51	—	NC
16	—	NC	34	I/O	TRF _{CB}	52	—	NC
17	I/O	D1	35	I	RxD _B			
18	I/O	D0	36	I	X11B/STFXCB			

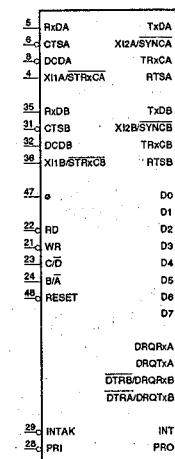


INPUTS				FUNCTION
WR	RD	B/A	C/D	
0	1	0	0	CHANNEL A WRITE (Tx/D)
		1	0	CHANNEL B WRITE (Tx/D)
1	0	1	0	CHANNEL A READ (Rx/D)
		0	0	CHANNEL B READ (Rx/D)
0	1	1	1	CHANNEL A WRITE (CONTROL REGISTER)
		0	1	CHANNEL B WRITE (CONTROL REGISTER)
1	0	1	1	CHANNEL A READ (STATUS REGISTER)
		0	1	CHANNEL B READ (STATUS REGISTER)
1	1	X	X	HIGH-IMPEDANCE
0	0	X	X	INHIBIT

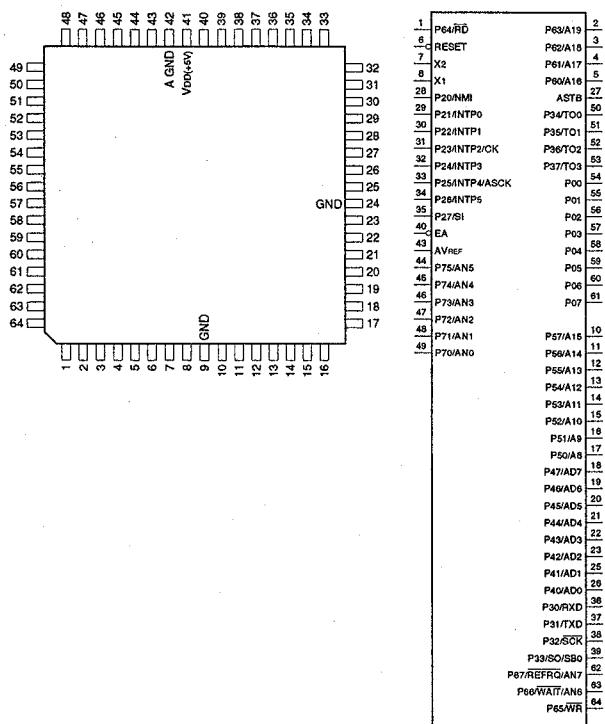
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

CK	: SYSTEM CLOCK INPUT
WR	: WRITE ENABLE INPUT
RD	: READ ENABLE INPUT
B/A	: CHANNEL B/A SELECT INPUT
C/D	: CONTROL/DATA SELECT INPUT
D0-D7	: DATA BUS INPUTS/OUTPUTS
INT	: INTERRUPT OUTPUT
INTAK	: INTERRUPT ACKNOWLEDGE INPUT
PRI	: PRIORITY INPUT
DRQTxA	: DMA REQUEST TxA OUTPUT
DRQRxA	: DMA REQUEST RxA OUTPUT
PRO	: PRIORITY OUTPUT

DTFR/DQRTx:B : DATA TERMINAL READY A/DMA REQUEST Tx/B OUTPUT
DTFR/DQFRx:B : DATA TERMINAL READY B/DMA REQUEST Rx/B OUTPUT
CTSA, CTSB : CLEAR TO SEND A/B INPUT
DCDA, DCDB : DATA CARRIER DETECT A/B INPUT
RTSA, RTSB : REQUEST TO SEND A/B OUTPUT
RESET : RESET INPUT



UPD78P218AGC-AB8 (NEC)

C-MOS 8-BIT SINGLE CHIP MICROCOMPUTER WITH ONE TIME PROM
-TOP VIEW-

PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	I/O	P64/RD	17	I/O	P50/A8	33	I	P25/INTP4/ASCK	49	I	P70/AN0
2	O	P63/A19	18	I/O	P47/AD7	34	I	P26/INTP5	50	O	P34/TO0
3	O	P62/A18	19	I/O	P46/AD6	35	I	P27/SI	51	O	P35/TO1
4	O	P61/A17	20	I/O	P45/AD5	36	I/O	P30/RXD	52	O	P36/TO2
5	O	P60/A16	21	I/O	P44/AD4	37	I/O	P31/TXD	53	O	P37/TO3
6	I	RESET	22	I/O	P43/AD3	38	I/O	P32/SCK	54	O	P00
7	I	X2	23	I/O	P42/AD2	39	I/O	P33/SO/SB0	55	O	P01
8	I	X1	24	—	GND	40	I	EA	56	O	P02
9	—	GND	25	I/O	P41/AD1	41	—	VDD	57	O	P03
10	I/O	P57/A15	26	I/O	P40/AD0	42	—	A GND	58	O	P04
11	I/O	P56/A14	27	O	ASTB	43	I	AVREF	59	O	P05
12	I/O	P55/A13	28	I	P20/NMI	44	I	P75/AN5	60	O	P06
13	I/O	P54/A12	29	I	P21/INTP0	45	I	P74/AN4	61	O	P07
14	I/O	P53/A11	30	I	P22/INTP1	46	I	P73/AN3	62	I/O	P67/REFRQ/AN7
15	I/O	P52/A10	31	I	P23/INTP2/CK	47	I	P72/AN2	63	I/O	P66/WAIT/AN6
16	I/O	P51/A9	32	I	P24/INTP3	48	I	P71/AN1	64	I/O	P65/WR

INPUT

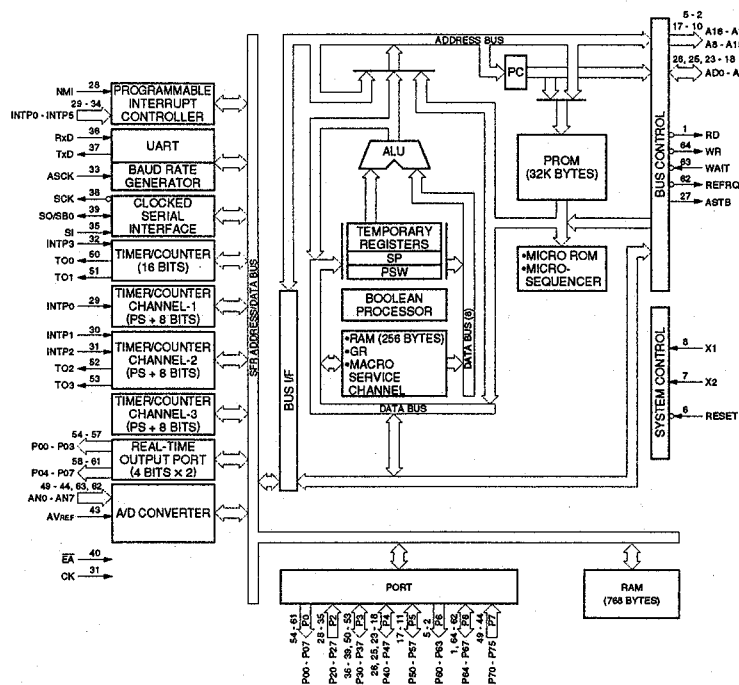
AN0 - AN7 : ANALOG DATA
 ASCK : ASYNCHRONOUS SERIAL CLOCK
 AVREF : REFERENCE VOLTAGE
 CK : CLOCK
 EA : EXTERNAL ACCESS
 INTP0 - INTP5 : INTERRUPT FROM PERIPHERALS
 NMI : NON-MASKABLE INTERRUPT
 P20 - P27 : PORT 2
 P70 - P75 : PORT 7
 RESET : SYSTEM RESET
 RXD : RECEIVE DATA
 SI : SERIAL DATA
 WAIT : WAIT
 X1, X2 : EXTERNAL CRYSTAL OSCILLATOR

OUTPUT

A8 - A19 : ADDRESS BUS
 ASTB : ADDRESS STROBE
 P00 - P07 : PORT 0
 P60 - P63 : PORT 6
 RD : READ STROBE
 REFRQ : REFRESH REQUEST
 SCK : SERIAL CLOCK
 SO : SERIAL DATA
 TO0 - TO3 : TIMER DATA
 TXD : TRANSMIT DATA
 WR : WRITE STROBE

INPUT/OUTPUT

AD0 - AD7 : ADDRESS/DATA BUS
 P30 - P37 : PORT 3
 P40 - P47 : PORT 4
 P50 - P57 : PORT 5
 P64 - P67 : PORT 6
 SB0 : SERIAL BUS



SECTION 7 SPARE PARTS

7-1. NOTES ON REPAIR PARTS

(1) Safety Related Components Warning

Components marked \triangle are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

(2) Standardization of Parts

Repair parts supplied from Sony Parts Center may not be always identical with the parts which actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".

This manual's exploded views and electrical spare parts list are indicating the part numbers of "the standardized genuine parts at present".

(3) Stock of Parts

Parts marked with "o" SP (Supply Code) column of the spare parts list are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

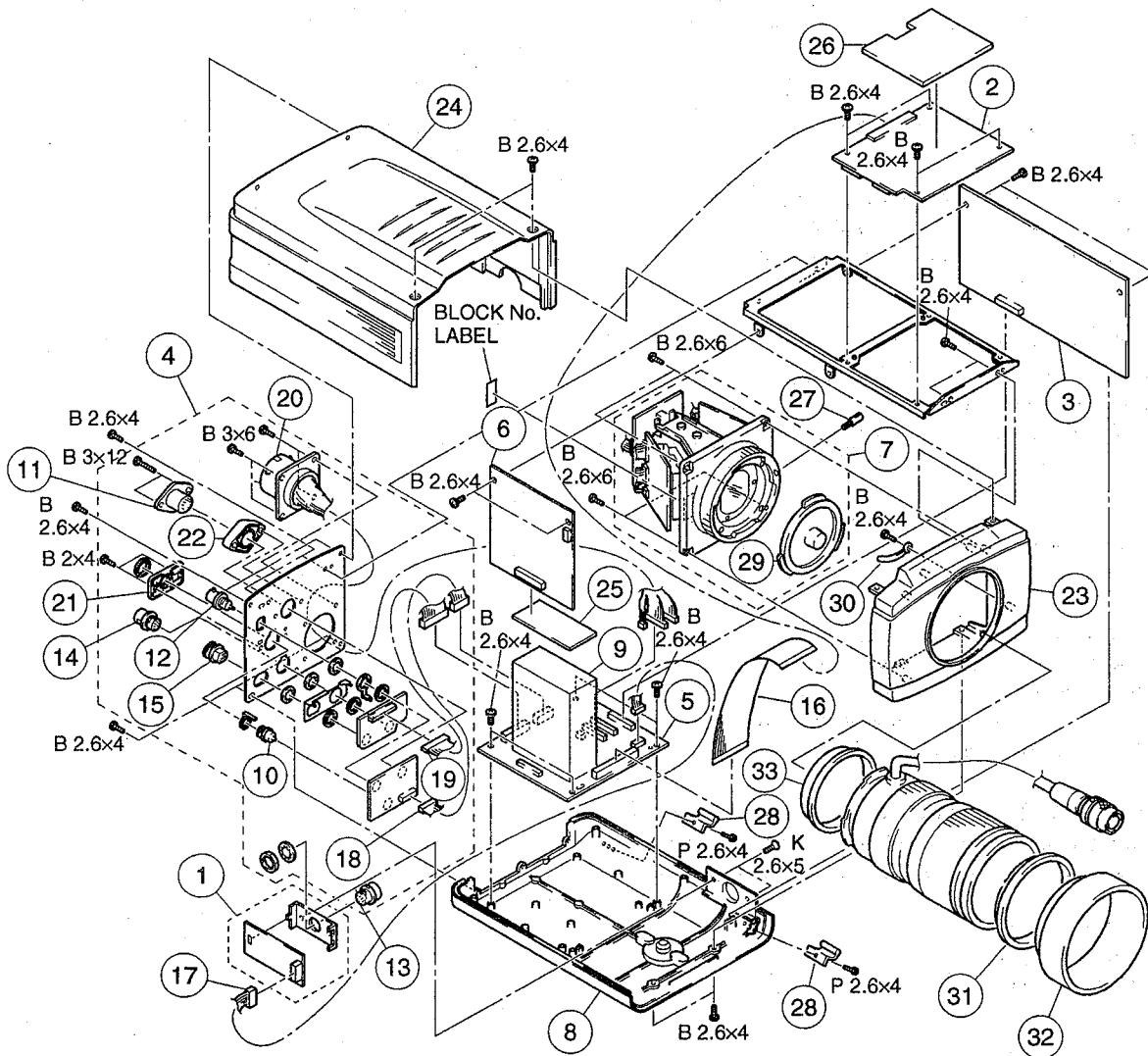
(4) Units for Capacitors, Inductors and Resistors

The following units are assumed in schematic diagrams, electrical parts list and exploded views unless otherwise specified.

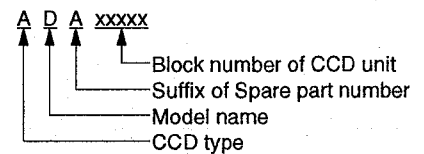
Capacitors : μF
Inductors : μH
Resistors : Ω

CAMERA ASSY

7-2. EXPLODED VIEWS

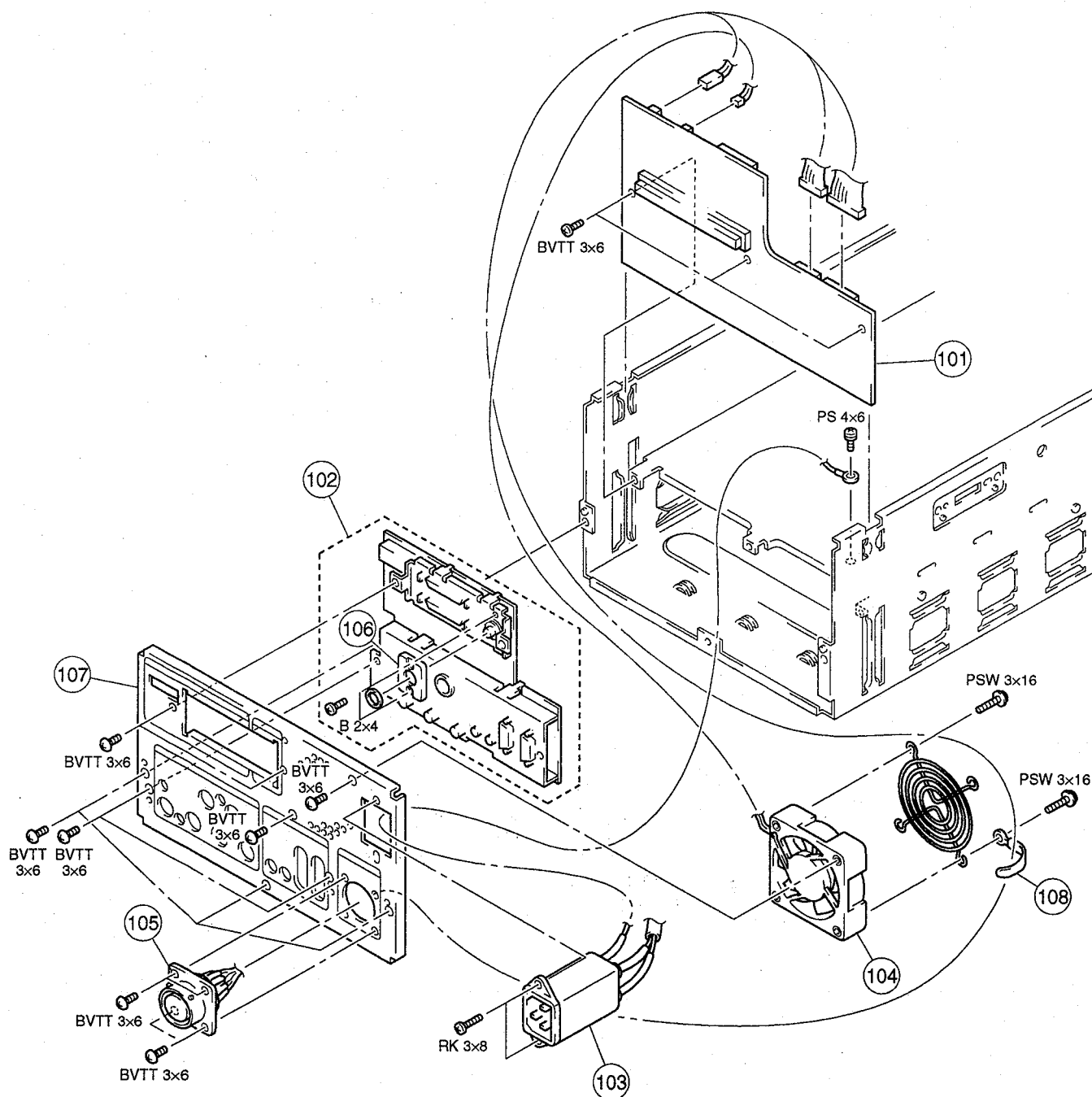


*How to read the CCD BLOCK No.



No.	Part No.	SP Description
1	A-8313-449-A	o MOUNTED CIRCUIT BOARD, CN-1401
2	A-8313-462-A	o MOUNTED CIRCUIT BOARD, TG-180
3	A-8313-463-A	o MOUNTED CIRCUIT BOARD, PR-228
4	A-8313-466-A	s REAR ASSY
5	A-8313-838-A	o MOUNTED CIRCUIT BOARD, MB-724
6	A-8313-839-A	o MOUNTED CIRCUIT BOARD, AT-115
7	A-8315-334-A	s CCD BLOCK ASSY
8	X-3679-082-1	o BASE ASSY, BOTTOM
9	1-475-162-11	s CONVERTER UNIT, DC-DC
10	1-540-256-21	s SOCKET, SYNCHRONIZE
11	1-561-284-21	s SOCKET, DIN 8P
12	1-562-382-31	s CONNECTOR, BNC
13	1-562-221-51	o CONNECTOR, 12P FEMALE
14	1-569-422-11	s CONNECTOR, (ROUND TYPE) 20P
15	1-779-426-11	o CONNECTOR, (ROUND TYPE) 12P
16	1-782-281-11	s WIRE, FLAT TYPE (30-CORE)
17	1-957-462-11	o HARNESS, SUB (MC-1)

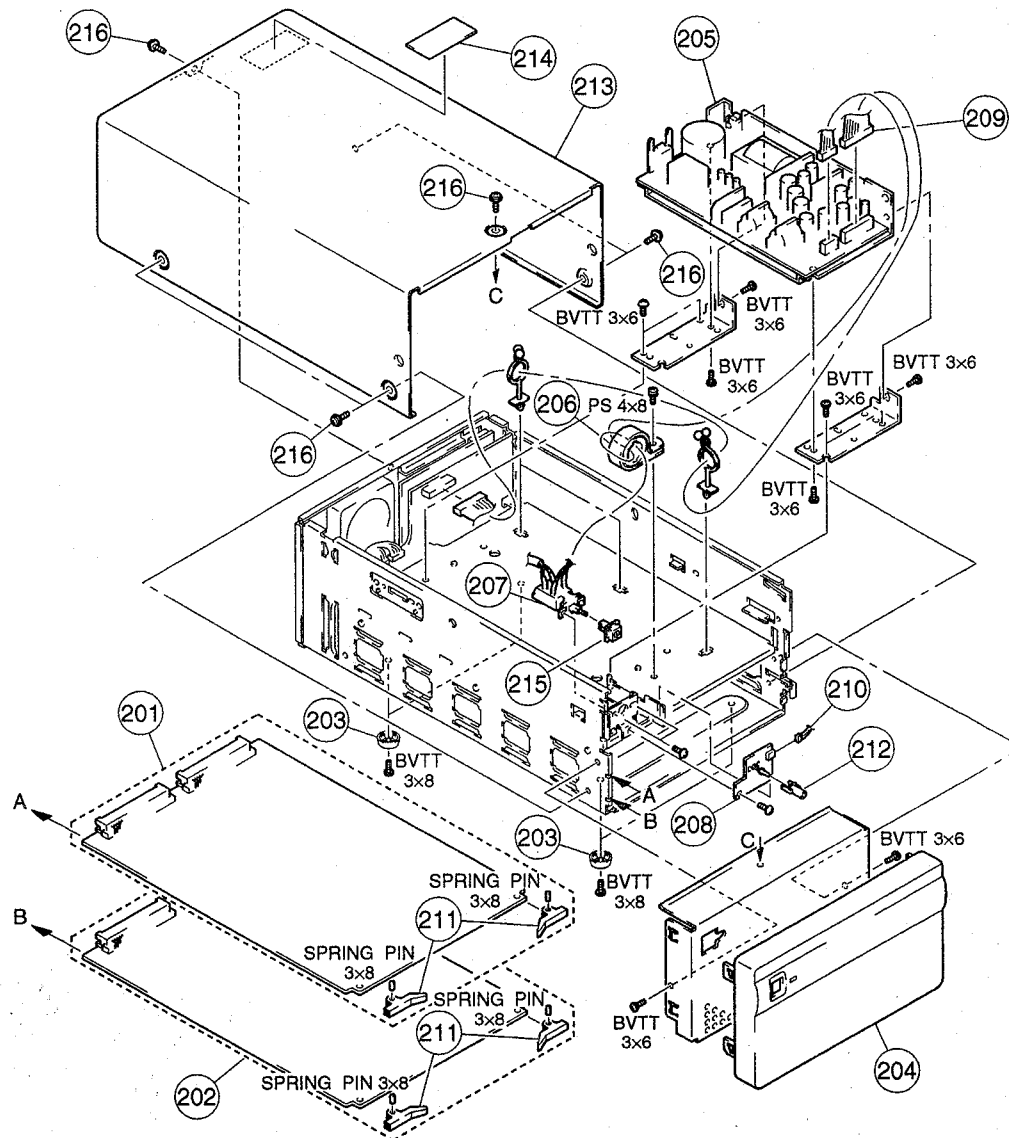
No.	Part No.	SP Description
18	1-957-463-11	s HARNESS, SUB (MC-2)
19	1-957-464-11	s HARNESS, SUB (MC-3)
20	1-957-465-11	s HARNESS, SUB (MC-4)
21	3-184-116-01	s INSULATOR, SOCKET
22	3-184-118-01	s SPACER, DIN
23	3-607-511-01	o FRONT BASE
24	3-607-513-01	o TOP COVER
25	3-607-518-01	o HEAT SHEET
26	3-608-412-02	o HEAT SHEET 2
27	3-678-629-00	s LEVER, MOUNT
28	3-678-684-00	o HOLDER, CABLE
29	3-699-048-01	s CAP, MOUNT
30	3-703-397-01	s STOPPER, WIRING
31	3-709-102-01	s CAP, FRONT (VCL-1205BYS)
32	3-709-221-01	s HOOD (VCL-1205BYS)
33	3-709-222-01	s CAP, REAR (VCL-1205BYS)



No.	Part No.	SP Description
101	A-8313-453-A	o MOUNTED CIRCUIT BOARD, MB-725
102	A-8313-454-A	o MOUNTED CIRCUIT BOARD, CN-1396
103	Δ 1-251-141-11	s INLET, AC (3P)
104	1-541-981-11	s MOTOR, DC FAN
105	1-957-454-11	s HARNESS, SUB (CAM)

No.	Part No.	SP Description
106	3-184-116-01	s INSULATOR, SOCKET
107	3-607-507-01	o REAR PANEL
108	3-703-397-01	s STOPPER, WIRING

FRONT PANEL



No. Part No. SP Description

201	A-8313-460-A	o MOUNTED CIRCUIT BOARD, ADA-52
202	A-8313-461-A	o MOUNTED CIRCUIT BOARD, SY-243
203	X-3556-910-0	s FOOT ASSY, MF
204	X-3679-083-1	o PANEL ASSY, FRONT
205	Δ 1-468-173-11	s SWITCHING REGULATOR
206	1-543-590-21	s CORE, TROIDAL
207	Δ 1-571-877-11	s SWITCH, PUSH (AC POWER)
208	1-665-437-11	o PRINTED CIRCUIT BOARD, LED-280
209	1-957-453-11	o HARNESS, SUB (DC1)
210	1-957-455-11	o HARNESS, SUB (LFD)

No. Part No. SP Description

211	2-182-909-01	o LEVER, PC BOARD
212	3-174-895-01	o HOLDER, LED
213	3-601-429-01	o COVER
214	3-607-522-01	o LABEL, MODE SELECT
215	4-627-977-01	s BUTTON, SWITCH
216	4-886-821-11	s SCREW, M3 CASE

7-3. ELECTRICAL PARTS LIST

ADA-52 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8313-460-A	o MOUNTED CIRCUIT BOARD, ADA-52
2pcs	2-182-909-01	o LEVER, PC BOARD
2pcs	7-626-320-11	s PIN, SPRING 3X8
C1	1-126-205-11	s ELECT 47uF 20% 6.3V
C2	1-126-205-11	s ELECT 47uF 20% 6.3V
C3	1-163-038-91	s CERAMIC 0.1uF 25V
C4	1-163-038-91	s CERAMIC 0.1uF 25V
C5	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C6	1-164-232-11	s CERAMIC, CHIP 0.01uF 10% 50V
C7	1-163-275-11	s CERAMIC 0.001uF 5% 50V
C8	1-163-087-00	s CERAMIC, CHIP 4PF 50V
C9	1-163-222-11	s CERAMIC 5PF 0.25PF 50V
C10	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C11	1-163-038-91	s CERAMIC 0.1uF 25V
C12	1-163-038-91	s CERAMIC 0.1uF 25V
C13	1-163-224-11	s CERAMIC, CHIP 7PF 0.25PF 50V
C14	1-163-222-11	s CERAMIC 5PF 0.25PF 50V
C15	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V
C16	1-163-251-11	s CERAMIC, CHIP 100PF 5% 50V
C17	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C18	1-126-205-11	s ELECT 47uF 20% 6.3V
C19	1-126-205-11	s ELECT 47uF 20% 6.3V
C20	1-163-038-91	s CERAMIC 0.1uF 25V
C21	1-163-038-91	s CERAMIC 0.1uF 25V
C22	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C23	1-164-232-11	s CERAMIC, CHIP 0.01uF 10% 50V
C24	1-163-275-11	s CERAMIC 0.001uF 5% 50V
C25	1-163-087-00	s CERAMIC, CHIP 4PF 50V
C26	1-163-222-11	s CERAMIC 5PF 0.25PF 50V
C27	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C28	1-163-038-91	s CERAMIC 0.1uF 25V
C29	1-163-038-91	s CERAMIC 0.1uF 25V
C30	1-163-224-11	s CERAMIC, CHIP 7PF 0.25PF 50V
C31	1-163-222-11	s CERAMIC 5PF 0.25PF 50V
C32	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V
C33	1-163-251-11	s CERAMIC, CHIP 100PF 5% 50V
C34	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C35	1-126-205-11	s ELECT 47uF 20% 6.3V
C36	1-126-205-11	s ELECT 47uF 20% 6.3V
C37	1-163-038-91	s CERAMIC 0.1uF 25V
C38	1-163-038-91	s CERAMIC 0.1uF 25V
C39	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C40	1-164-232-11	s CERAMIC, CHIP 0.01uF 10% 50V
C41	1-163-275-11	s CERAMIC 0.001uF 5% 50V
C42	1-163-087-00	s CERAMIC, CHIP 4PF 50V
C43	1-163-222-11	s CERAMIC 5PF 0.25PF 50V
C44	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C45	1-163-038-91	s CERAMIC 0.1uF 25V
C46	1-163-038-91	s CERAMIC 0.1uF 25V
C47	1-163-224-11	s CERAMIC, CHIP 7PF 0.25PF 50V
C48	1-163-222-11	s CERAMIC 5PF 0.25PF 50V
C49	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V
C50	1-163-251-11	s CERAMIC, CHIP 100PF 5% 50V
C51	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C52	1-104-852-11	s TANTALUM, CHIP 22uF 20% 10V
C53	1-126-205-11	s ELECT 47uF 20% 6.3V
C54	1-163-038-91	s CERAMIC 0.1uF 25V
C55	1-163-038-91	s CERAMIC 0.1uF 25V

(ADA-52 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C56	1-104-847-11	s TANTALUM, CHIP 22uF 20% 4V
C57	1-163-038-91	s CERAMIC 0.1uF 25V
C58	1-126-205-11	s ELECT 47uF 20% 6.3V
C59	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C60	1-163-038-91	s CERAMIC 0.1uF 25V
C61	1-163-038-91	s CERAMIC 0.1uF 25V
C62	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C63	1-163-038-91	s CERAMIC 0.1uF 25V
C64	1-126-205-11	s ELECT 47uF 20% 6.3V
C65	1-163-038-91	s CERAMIC 0.1uF 25V
C66	1-104-852-11	s TANTALUM, CHIP 22uF 20% 10V
C67	1-126-205-11	s ELECT 47uF 20% 6.3V
C68	1-163-038-91	s CERAMIC 0.1uF 25V
C69	1-163-038-91	s CERAMIC 0.1uF 25V
C70	1-104-847-11	s TANTALUM, CHIP 22uF 20% 4V
C71	1-163-038-91	s CERAMIC 0.1uF 25V
C72	1-126-205-11	s ELECT 47uF 20% 6.3V
C73	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C74	1-163-038-91	s CERAMIC 0.1uF 25V
C75	1-163-038-91	s CERAMIC 0.1uF 25V
C76	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C77	1-163-038-91	s CERAMIC 0.1uF 25V
C78	1-126-205-11	s ELECT 47uF 20% 6.3V
C79	1-163-038-91	s CERAMIC 0.1uF 25V
C80	1-104-852-11	s TANTALUM, CHIP 22uF 20% 10V
C81	1-126-205-11	s ELECT 47uF 20% 6.3V
C82	1-163-038-91	s CERAMIC 0.1uF 25V
C83	1-163-038-91	s CERAMIC 0.1uF 25V
C84	1-104-847-11	s TANTALUM, CHIP 22uF 20% 4V
C85	1-163-038-91	s CERAMIC 0.1uF 25V
C86	1-126-205-11	s ELECT 47uF 20% 6.3V
C87	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C88	1-163-038-91	s CERAMIC 0.1uF 25V
C89	1-163-038-91	s CERAMIC 0.1uF 25V
C90	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C91	1-163-038-91	s CERAMIC 0.1uF 25V
C92	1-126-205-11	s ELECT 47uF 20% 6.3V
C93	1-163-038-91	s CERAMIC 0.1uF 25V
C94	1-163-231-11	s CERAMIC 15PF 5% 50V
C95	1-163-231-11	s CERAMIC 15PF 5% 50V
C96	1-126-205-11	s ELECT 47uF 20% 6.3V
C97	1-163-038-91	s CERAMIC 0.1uF 25V
C98	1-126-205-11	s ELECT 47uF 20% 6.3V
C99	1-163-038-91	s CERAMIC 0.1uF 25V
C100	1-135-070-00	s TANTALUM, CHIP 0.1uF 10% 35V
C101	1-164-695-11	s CERAMIC 0.0022uF 5% 50V
C102	1-164-695-11	s CERAMIC 0.0022uF 5% 50V
C103	1-126-205-11	s ELECT 47uF 20% 6.3V
C104	1-163-038-91	s CERAMIC 0.1uF 25V
C105	1-126-934-11	s ELECT 220uF 20% 16V
C106	1-126-934-11	s ELECT 220uF 20% 16V
C107	1-126-933-11	s ELECT 100uF 20% 16V
C108	1-126-933-11	s ELECT 100uF 20% 16V
C109	1-163-038-91	s CERAMIC 0.1uF 25V
C110	1-163-038-91	s CERAMIC 0.1uF 25V
C111	1-163-038-91	s CERAMIC 0.1uF 25V
C112	1-163-038-91	s CERAMIC 0.1uF 25V
C113	1-163-038-91	s CERAMIC 0.1uF 25V
C114	1-163-038-91	s CERAMIC 0.1uF 25V

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Ref. No. or Q'ty	Part No.	SP Description
C261	1-163-038-91	s CERAMIC 0.1uF 25V
C262	1-163-038-91	s CERAMIC 0.1uF 25V
C263	1-163-038-91	s CERAMIC 0.1uF 25V
C264	1-163-038-91	s CERAMIC 0.1uF 25V
C265	1-163-038-91	s CERAMIC 0.1uF 25V
C266	1-163-038-91	s CERAMIC 0.1uF 25V
C267	1-163-038-91	s CERAMIC 0.1uF 25V
C268	1-163-038-91	s CERAMIC 0.1uF 25V
C269	1-163-038-91	s CERAMIC 0.1uF 25V
C270	1-163-038-91	s CERAMIC 0.1uF 25V
C271	1-163-038-91	s CERAMIC 0.1uF 25V
C272	1-163-038-91	s CERAMIC 0.1uF 25V
C273	1-163-038-91	s CERAMIC 0.1uF 25V
C274	1-163-038-91	s CERAMIC 0.1uF 25V
C275	1-163-038-91	s CERAMIC 0.1uF 25V
C276	1-163-038-91	s CERAMIC 0.1uF 25V
C277	1-163-038-91	s CERAMIC 0.1uF 25V
C278	1-163-038-91	s CERAMIC 0.1uF 25V
C279	1-163-038-91	s CERAMIC 0.1uF 25V
C280	1-163-038-91	s CERAMIC 0.1uF 25V
C281	1-163-038-91	s CERAMIC 0.1uF 25V
C282	1-163-038-91	s CERAMIC 0.1uF 25V
C283	1-163-038-91	s CERAMIC 0.1uF 25V
C284	1-163-038-91	s CERAMIC 0.1uF 25V
C285	1-163-038-91	s CERAMIC 0.1uF 25V
C287	1-163-038-91	s CERAMIC 0.1uF 25V
C288	1-163-133-00	s CERAMIC, CHIP 470PF 5% 50V
C289	1-163-133-00	s CERAMIC, CHIP 470PF 5% 50V
C290	1-163-133-00	s CERAMIC, CHIP 470PF 5% 50V
C291	1-163-133-00	s CERAMIC, CHIP 470PF 5% 50V
C292	1-163-133-00	s CERAMIC, CHIP 470PF 5% 50V
C293	1-163-133-00	s CERAMIC, CHIP 470PF 5% 50V
C294	1-163-133-00	s CERAMIC, CHIP 470PF 5% 50V
C295	1-163-133-00	s CERAMIC, CHIP 470PF 5% 50V
C296	1-163-127-00	s CERAMIC, CHIP 270PF 5% 50V
C297	1-163-127-00	s CERAMIC, CHIP 270PF 5% 50V
C298	1-163-251-11	s CERAMIC, CHIP 100PF 5% 50V
C299	1-163-251-11	s CERAMIC, CHIP 100PF 5% 50V
C300	1-163-127-00	s CERAMIC, CHIP 270PF 5% 50V
C301	1-126-205-11	s ELECT 47uF 20% 6.3V
C302	1-163-038-91	s CERAMIC 0.1uF 25V
C303	1-163-038-91	s CERAMIC 0.1uF 25V
C304	1-163-038-91	s CERAMIC 0.1uF 25V
C305	1-163-038-91	s CERAMIC 0.1uF 25V
C306	1-163-038-91	s CERAMIC 0.1uF 25V
C307	1-163-038-91	s CERAMIC 0.1uF 25V
C308	1-163-038-91	s CERAMIC 0.1uF 25V
C309	1-126-205-11	s ELECT 47uF 20% 6.3V
C310	1-126-205-11	s ELECT 47uF 20% 6.3V
C311	1-163-038-91	s CERAMIC 0.1uF 25V
C312	1-163-038-91	s CERAMIC 0.1uF 25V
C313	1-126-205-11	s ELECT 47uF 20% 6.3V
C314	1-126-205-11	s ELECT 47uF 20% 6.3V
C315	1-163-038-91	s CERAMIC 0.1uF 25V
C316	1-163-038-91	s CERAMIC 0.1uF 25V
C317	1-126-205-11	s ELECT 47uF 20% 6.3V
C318	1-126-205-11	s ELECT 47uF 20% 6.3V
C319	1-163-243-11	s CERAMIC, CHIP 47PF 5% 50V
C320	1-163-222-11	s CERAMIC 5PF 0.25PF 50V

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Ref. No. or Q'ty	Part No.	SP Description
C321	1-163-038-91	s CERAMIC 0.1uF 25V
C322	1-163-038-91	s CERAMIC 0.1uF 25V
C323	1-163-038-91	s CERAMIC 0.1uF 25V
C324	1-163-038-91	s CERAMIC 0.1uF 25V
C325	1-163-038-91	s CERAMIC 0.1uF 25V
C326	1-163-038-91	s CERAMIC 0.1uF 25V
C327	1-110-569-11	s TANTAL 47uF 20% 6.3V
C329	1-110-569-11	s TANTAL 47uF 20% 6.3V
C330	1-163-231-11	s CERAMIC 15PF 5% 50V
C331	1-163-227-11	s CERAMIC, CHIP 10PF 5% 50V
C332	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C333	1-163-038-91	s CERAMIC 0.1uF 25V
C334	1-163-038-91	s CERAMIC 0.1uF 25V
C335	1-110-569-11	s TANTAL 47uF 20% 6.3V
C336	1-163-231-11	s CERAMIC 15PF 5% 50V
C337	1-163-227-11	s CERAMIC, CHIP 10PF 5% 50V
C338	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C339	1-163-038-91	s CERAMIC 0.1uF 25V
C340	1-163-038-91	s CERAMIC 0.1uF 25V
C341	1-110-569-11	s TANTAL 47uF 20% 6.3V
C342	1-163-231-11	s CERAMIC 15PF 5% 50V
C343	1-163-227-11	s CERAMIC, CHIP 10PF 5% 50V
C344	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C345	1-163-038-91	s CERAMIC 0.1uF 25V
C346	1-163-038-91	s CERAMIC 0.1uF 25V
C347	1-110-569-11	s TANTAL 47uF 20% 6.3V
C348	1-163-231-11	s CERAMIC 15PF 5% 50V
C349	1-163-227-11	s CERAMIC, CHIP 10PF 5% 50V
C350	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C351	1-163-038-91	s CERAMIC 0.1uF 25V
C352	1-163-038-91	s CERAMIC 0.1uF 25V
C353	1-110-569-11	s TANTAL 47uF 20% 6.3V
C354	1-163-231-11	s CERAMIC 15PF 5% 50V
C355	1-163-227-11	s CERAMIC, CHIP 10PF 5% 50V
C356	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C357	1-163-038-91	s CERAMIC 0.1uF 25V
C358	1-163-038-91	s CERAMIC 0.1uF 25V
C359	1-110-569-11	s TANTAL 47uF 20% 6.3V
C360	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V
C361	1-163-227-11	s CERAMIC, CHIP 10PF 5% 50V
C362	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C363	1-163-038-91	s CERAMIC 0.1uF 25V
C364	1-163-038-91	s CERAMIC 0.1uF 25V
C365	1-110-569-11	s TANTAL 47uF 20% 6.3V
C366	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V
C367	1-163-227-11	s CERAMIC, CHIP 10PF 5% 50V
C368	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C369	1-163-038-91	s CERAMIC 0.1uF 25V
C370	1-163-038-91	s CERAMIC 0.1uF 25V
C371	1-110-569-11	s TANTAL 47uF 20% 6.3V
C372	1-126-206-11	s ELECT 100uF 20% 6.3V
C373	1-126-206-11	s ELECT 100uF 20% 6.3V
C374	1-163-038-91	s CERAMIC 0.1uF 25V
C375	1-163-038-91	s CERAMIC 0.1uF 25V
C376	1-163-251-11	s CERAMIC, CHIP 100PF 5% 50V
C377	1-163-087-00	s CERAMIC, CHIP 4PF 50V
C378	1-163-038-91	s CERAMIC 0.1uF 25V
C379	1-163-038-91	s CERAMIC 0.1uF 25V
C381	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V

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Ref. No. or Q'ty	Part No.	SP Description
C382	1-163-038-91	s CERAMIC 0.1uF 25V
C383	1-163-038-91	s CERAMIC 0.1uF 25V
C384	1-163-038-91	s CERAMIC 0.1uF 25V
C385	1-163-038-91	s CERAMIC 0.1uF 25V
C386	1-163-038-91	s CERAMIC 0.1uF 25V
C387	1-163-038-91	s CERAMIC 0.1uF 25V
C388	1-163-038-91	s CERAMIC 0.1uF 25V
C389	1-163-038-91	s CERAMIC 0.1uF 25V
C390	1-163-038-91	s CERAMIC 0.1uF 25V
C391	1-163-038-91	s CERAMIC 0.1uF 25V
C392	1-163-038-91	s CERAMIC 0.1uF 25V
C393	1-163-038-91	s CERAMIC 0.1uF 25V
C394	1-163-038-91	s CERAMIC 0.1uF 25V
C395	1-163-038-91	s CERAMIC 0.1uF 25V
C400	1-163-038-91	s CERAMIC 0.1uF 25V
C401	1-163-038-91	s CERAMIC 0.1uF 25V
C402	1-163-038-91	s CERAMIC 0.1uF 25V
C403	1-163-038-91	s CERAMIC 0.1uF 25V
C404	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C405	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C406	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C500	1-163-038-91	s CERAMIC 0.1uF 25V
C501	1-163-217-11	s CERAMIC 1PF 0.25PF 50V
C502	1-163-217-11	s CERAMIC 1PF 0.25PF 50V
C503	1-163-217-11	s CERAMIC 1PF 0.25PF 50V
C504	1-163-038-91	s CERAMIC 0.1uF 25V
CN1	1-778-261-11	o CONNECTOR, BOARD TO BOARD 124P
CV1	1-141-311-11	s VAR, TRIMMER 20PF
CV2	1-141-311-11	s VAR, TRIMMER 20PF
D1	8-719-105-51	s DIODE RD3.6M-B1
D2	8-719-105-51	s DIODE RD3.6M-B1
D3	8-719-105-51	s DIODE RD3.6M-B1
D4	8-719-105-51	s DIODE RD3.6M-B1
F201	1-532-745-11	s FUSE 3.15A 125V
FH201	1-533-189-11	s HOLDER, FUSE
FH202	1-533-189-11	s HOLDER, FUSE
FL101	1-239-558-11	s FILTER, CHIP EMI
FL201	1-421-773-11	s FILTER, NOISE REMOVAL
FL301	1-239-289-11	s FILTER, LOW-PASS
FL302	1-239-289-11	s FILTER, LOW-PASS
FL303	1-239-289-11	s FILTER, LOW-PASS
FL304	1-239-558-11	s FILTER, CHIP EMI
IC1	8-752-053-26	s IC CXA1399Q-T4
IC2	8-759-423-92	s IC SPT7855SCT
IC3	8-752-053-26	s IC CXA1399Q-T4
IC4	8-759-423-92	s IC SPT7855SCT
IC5	8-752-053-26	s IC CXA1399Q-T4
IC6	8-759-423-92	s IC SPT7855SCT
IC8	8-759-174-16	s IC TC74VHC244F
IC9	8-759-174-16	s IC TC74VHC244F
IC10	8-759-174-16	s IC TC74VHC244F
IC11	8-759-174-16	s IC TC74VHC244F
IC12	8-759-174-16	s IC TC74VHC244F
IC13	8-759-174-16	s IC TC74VHC244F
IC14	8-759-174-16	s IC TC74VHC244F

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Ref. No. or Q'ty	Part No.	SP Description
IC15	8-759-174-16	s IC TC74VHC244F
IC16	8-759-186-39	s IC TC74VHC74F
IC17	8-759-185-84	s IC TC74VHC161F(EL)
IC18	8-759-185-84	s IC TC74VHC161F(EL)
IC19	8-752-326-08	s IC CXD1159Q
IC20	8-759-250-81	s IC TC5081AP
IC22	8-759-231-53	s IC TA7805S
IC23	8-759-245-79	s IC TA79005S
IC24	8-759-981-48	s IC TL082M
IC25	8-759-150-64	s IC UPC78L08T
IC26	8-759-372-52	s IC OP293-S
IC27	8-759-081-44	s IC TC74VHC04F
IC28	8-759-031-84	s IC SC7S04F
IC30	8-759-174-16	s IC TC74VHC244F
IC31	8-759-174-16	s IC TC74VHC244F
IC32	8-759-372-52	s IC OP293-S
IC33	8-759-984-88	s IC LM6361M
IC34	8-759-372-52	s IC OP293-S
IC35	8-759-984-88	s IC LM6361M
IC36	8-759-372-52	s IC OP293-S
IC37	8-759-984-88	s IC LM6361M
IC201	8-759-186-47	s IC TC74VHC138F
IC202	8-759-186-47	s IC TC74VHC138F
IC203	8-759-186-47	s IC TC74VHC138F
IC204	8-759-186-47	s IC TC74VHC138F
IC205	8-759-081-44	s IC TC74VHC04F
IC206	8-759-186-38	s IC TC74VHC32F
IC207	8-759-186-38	s IC TC74VHC32F
IC208	8-759-186-29	s IC TC74VHC11F
IC210	8-759-186-38	s IC TC74VHC32F
IC211	8-759-186-38	s IC TC74VHC32F
IC214	8-759-186-38	s IC TC74VHC32F
IC215	8-759-186-38	s IC TC74VHC32F
IC218	8-759-186-38	s IC TC74VHC32F
IC219	8-759-186-38	s IC TC74VHC32F
IC220	8-759-186-29	s IC TC74VHC11F
IC222	8-759-186-38	s IC TC74VHC32F
IC223	8-759-186-38	s IC TC74VHC32F
IC226	8-759-186-38	s IC TC74VHC32F
IC227	8-759-186-38	s IC TC74VHC32F
IC229	8-759-081-44	s IC TC74VHC04F
IC230	8-759-186-38	s IC TC74VHC32F
IC231	8-759-186-38	s IC TC74VHC32F
IC232	8-759-186-29	s IC TC74VHC11F
IC234	8-759-186-38	s IC TC74VHC32F
IC235	8-759-186-38	s IC TC74VHC32F
IC238	8-759-174-16	s IC TC74VHC244F
IC239	8-759-174-16	s IC TC74VHC244F
IC240	8-759-174-16	s IC TC74VHC244F
IC242	8-759-186-02	s IC TC74VHCT245F(EL)
IC243	8-759-186-02	s IC TC74VHCT245F(EL)
IC244	8-759-186-02	s IC TC74VHCT245F(EL)
IC245	8-759-174-16	s IC TC74VHC244F
IC246	8-759-174-16	s IC TC74VHC244F
IC247	8-759-174-16	s IC TC74VHC244F
IC248	8-759-174-16	s IC TC74VHC244F
IC249	8-759-354-55	s IC HM5117800BJ-7EL
IC250	8-759-354-55	s IC HM5117800BJ-7EL
IC251	8-759-354-55	s IC HM5117800BJ-7EL

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Ref. No. or Q'ty	Part No.	SP Description
IC252	8-759-354-55	s IC HM5117800BJ-7EL
IC253	8-759-354-55	s IC HM5117800BJ-7EL
IC254	8-759-354-55	s IC HM5117800BJ-7EL
IC255	8-759-354-55	s IC HM5117800BJ-7EL
IC256	8-759-354-55	s IC HM5117800BJ-7EL
IC257	8-759-354-55	s IC HM5117800BJ-7EL
IC258	8-759-354-55	s IC HM5117800BJ-7EL
IC259	8-759-354-55	s IC HM5117800BJ-7EL
IC260	8-759-354-55	s IC HM5117800BJ-7EL
IC261	8-759-354-55	s IC HM5117800BJ-7EL
IC262	8-759-354-55	s IC HM5117800BJ-7EL
IC263	8-759-354-55	s IC HM5117800BJ-7EL
IC264	8-759-354-55	s IC HM5117800BJ-7EL
IC265	8-759-354-55	s IC HM5117800BJ-7EL
IC266	8-759-354-55	s IC HM5117800BJ-7EL
IC267	8-759-354-55	s IC HM5117800BJ-7EL
IC268	8-759-354-55	s IC HM5117800BJ-7EL
IC269	8-759-354-55	s IC HM5117800BJ-7EL
IC270	8-759-354-55	s IC HM5117800BJ-7EL
IC271	8-759-354-55	s IC HM5117800BJ-7EL
IC272	8-759-354-55	s IC HM5117800BJ-7EL
IC301	8-759-174-16	s IC TC74VHC244F
IC302	8-759-175-29	s IC TC74VHC374F
IC303	8-759-174-16	s IC TC74VHC244F
IC304	8-759-175-29	s IC TC74VHC374F
IC305	8-759-174-16	s IC TC74VHC244F
IC306	8-759-175-29	s IC TC74VHC374F
IC307	8-759-174-16	s IC TC74VHC244F
IC308	8-759-175-29	s IC TC74VHC374F
IC309	8-759-174-16	s IC TC74VHC244F
IC310	8-759-175-29	s IC TC74VHC374F
IC311	8-759-174-16	s IC TC74VHC244F
IC312	8-759-175-29	s IC TC74VHC374F
IC313	8-759-174-16	s IC TC74VHC244F
IC314	8-759-081-42	s IC TC74VHC00F
IC315	8-752-338-46	s IC CXD1178Q
IC316	8-759-186-39	s IC TC74VHC74F
IC317	8-752-068-43	s IC CXA1645M
IC318	8-759-927-29	s IC SN74HCU04ANS
IC320	8-759-710-86	s IC NJM2233BM
L1	1-412-282-41	s INDUCTOR 470uH
L2	1-412-282-41	s INDUCTOR 470uH
L3	1-412-282-41	s INDUCTOR 470uH
L4	1-412-282-41	s INDUCTOR 470uH
L5	1-412-282-41	s INDUCTOR 470uH
L6	1-412-282-41	s INDUCTOR 470uH
L7	1-410-373-31	s INDUCTOR CHIP 2.2uH
L9	1-410-373-31	s INDUCTOR CHIP 2.2uH
L11	1-410-373-31	s INDUCTOR CHIP 2.2uH
L13	1-410-373-31	s INDUCTOR CHIP 2.2uH
L14	1-410-373-31	s INDUCTOR CHIP 2.2uH
L15	1-410-373-31	s INDUCTOR CHIP 2.2uH
L16	1-410-389-31	s INDUCTOR CHIP 47uH
L17	1-410-389-31	s INDUCTOR CHIP 47uH
L18	1-410-389-31	s INDUCTOR CHIP 47uH
L20	1-410-373-31	s INDUCTOR CHIP 2.2uH
L21	1-410-373-31	s INDUCTOR CHIP 2.2uH
L22	1-410-373-31	s INDUCTOR CHIP 2.2uH
L23	1-410-373-31	s INDUCTOR CHIP 2.2uH

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Ref. No. or Q'ty	Part No.	SP Description
L24	1-410-373-31	s INDUCTOR CHIP 2.2uH
L301	1-410-373-31	s INDUCTOR CHIP 2.2uH
L302	1-410-373-31	s INDUCTOR CHIP 2.2uH
L303	1-410-373-31	s INDUCTOR CHIP 2.2uH
L304	1-410-373-31	s INDUCTOR CHIP 2.2uH
L305	1-410-373-31	s INDUCTOR CHIP 2.2uH
L306	1-410-373-31	s INDUCTOR CHIP 2.2uH
L307	1-410-373-31	s INDUCTOR CHIP 2.2uH
L308	1-410-373-31	s INDUCTOR CHIP 2.2uH
L309	1-410-373-31	s INDUCTOR CHIP 2.2uH
L311	1-410-381-11	s INDUCTOR CHIP 10uH
L312	1-410-381-11	s INDUCTOR CHIP 10uH
L313	1-410-373-31	s INDUCTOR CHIP 2.2uH
L314	1-410-373-31	s INDUCTOR CHIP 2.2uH
L315	1-410-373-31	s INDUCTOR CHIP 2.2uH
L316	1-410-373-31	s INDUCTOR CHIP 2.2uH
L317	1-410-373-31	s INDUCTOR CHIP 2.2uH
L318	1-410-373-31	s INDUCTOR CHIP 2.2uH
L319	1-410-373-31	s INDUCTOR CHIP 2.2uH
L320	1-410-373-31	s INDUCTOR CHIP 2.2uH
Q1	8-729-200-86	s TRANSISTOR 2SC2714-O
Q2	8-729-122-63	s TRANSISTOR 2SA1226
Q3	8-729-200-86	s TRANSISTOR 2SC2714-O
Q4	8-729-200-86	s TRANSISTOR 2SC2714-O
Q5	8-729-122-63	s TRANSISTOR 2SA1226
Q6	8-729-122-63	s TRANSISTOR 2SA1226
Q7	8-729-200-86	s TRANSISTOR 2SC2714-O
Q8	8-729-402-13	s TRANSISTOR XN1501
Q9	8-729-122-63	s TRANSISTOR 2SA1226
Q10	8-729-420-36	s TRANSISTOR XN2501
Q11	8-729-402-87	s TRANSISTOR XN2401
Q12	8-729-109-44	s TRANSISTOR 2SK94
Q13	8-729-200-86	s TRANSISTOR 2SC2714-O
Q14	8-729-122-63	s TRANSISTOR 2SA1226
Q15	8-729-200-86	s TRANSISTOR 2SC2714-O
Q16	8-729-200-86	s TRANSISTOR 2SC2714-O
Q17	8-729-122-63	s TRANSISTOR 2SA1226
Q18	8-729-122-63	s TRANSISTOR 2SA1226
Q19	8-729-200-86	s TRANSISTOR 2SC2714-O
Q20	8-729-402-13	s TRANSISTOR XN1501
Q21	8-729-122-63	s TRANSISTOR 2SA1226
Q22	8-729-420-36	s TRANSISTOR XN2501
Q23	8-729-402-87	s TRANSISTOR XN2401
Q24	8-729-109-44	s TRANSISTOR 2SK94
Q25	8-729-200-86	s TRANSISTOR 2SC2714-O
Q26	8-729-122-63	s TRANSISTOR 2SA1226
Q27	8-729-200-86	s TRANSISTOR 2SC2714-O
Q28	8-729-200-86	s TRANSISTOR 2SC2714-O
Q29	8-729-122-63	s TRANSISTOR 2SA1226
Q30	8-729-122-63	s TRANSISTOR 2SA1226
Q31	8-729-200-86	s TRANSISTOR 2SC2714-O
Q32	8-729-402-13	s TRANSISTOR XN1501
Q33	8-729-122-63	s TRANSISTOR 2SA1226
Q34	8-729-420-36	s TRANSISTOR XN2501
Q35	8-729-402-87	s TRANSISTOR XN2401
Q36	8-729-109-44	s TRANSISTOR 2SK94
Q40	8-729-122-63	s TRANSISTOR 2SA1226
Q41	8-729-200-86	s TRANSISTOR 2SC2714-O
Q42	8-729-122-63	s TRANSISTOR 2SA1226

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Ref. No. or Q'ty	Part No.	SP Description
Q43	8-729-200-86	s TRANSISTOR 2SC2714-0
Q44	8-729-122-63	s TRANSISTOR 2SA1226
Q45	8-729-200-86	s TRANSISTOR 2SC2714-0
Q301	8-729-120-28	s TRANSISTOR 2SC1623-L5L6
Q302	8-729-402-81	s TRANSISTOR XN4501
Q303	8-729-120-28	s TRANSISTOR 2SC1623-L5L6
Q304	8-729-120-28	s TRANSISTOR 2SC1623-L5L6
Q305	8-729-402-81	s TRANSISTOR XN4501
Q306	8-729-120-28	s TRANSISTOR 2SC1623-L5L6
Q307	8-729-120-28	s TRANSISTOR 2SC1623-L5L6
Q308	8-729-402-81	s TRANSISTOR XN4501
Q309	8-729-120-28	s TRANSISTOR 2SC1623-L5L6
Q310	8-729-402-13	s TRANSISTOR XN1501
Q311	8-729-122-63	s TRANSISTOR 2SA1226
Q312	8-729-420-36	s TRANSISTOR XN2501
Q313	8-729-402-87	s TRANSISTOR XN2401
Q314	8-729-402-13	s TRANSISTOR XN1501
Q315	8-729-122-63	s TRANSISTOR 2SA1226
Q316	8-729-420-36	s TRANSISTOR XN2501
Q317	8-729-402-87	s TRANSISTOR XN2401
Q318	8-729-402-13	s TRANSISTOR XN1501
Q319	8-729-122-63	s TRANSISTOR 2SA1226
Q320	8-729-420-36	s TRANSISTOR XN2501
Q321	8-729-402-87	s TRANSISTOR XN2401
Q322	8-729-402-13	s TRANSISTOR XN1501
Q323	8-729-122-63	s TRANSISTOR 2SA1226
Q324	8-729-420-36	s TRANSISTOR XN2501
Q325	8-729-402-87	s TRANSISTOR XN2401
Q326	8-729-402-13	s TRANSISTOR XN1501
Q327	8-729-122-63	s TRANSISTOR 2SA1226
Q328	8-729-420-36	s TRANSISTOR XN2501
Q329	8-729-402-87	s TRANSISTOR XN2401
Q330	8-729-402-13	s TRANSISTOR XN1501
Q331	8-729-122-63	s TRANSISTOR 2SA1226
Q332	8-729-420-36	s TRANSISTOR XN2501
Q333	8-729-402-87	s TRANSISTOR XN2401
Q334	8-729-402-13	s TRANSISTOR XN1501
Q335	8-729-122-63	s TRANSISTOR 2SA1226
Q336	8-729-420-36	s TRANSISTOR XN2501
Q337	8-729-402-87	s TRANSISTOR XN2401
Q338	8-729-120-28	s TRANSISTOR 2SC1623-L5L6
Q339	8-729-402-84	s TRANSISTOR XN4601
Q340	8-729-402-84	s TRANSISTOR XN4601
R1	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R4	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R6	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R7	1-216-009-00	s METAL, CHIP 22 5% 1/10W
R8	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R9	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R10	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R11	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R12	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R13	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R14	1-216-661-11	s METAL, CHIP 2.7K 0.5% 1/10W
R15	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R16	1-216-673-11	s METAL, CHIP 8.2K 0.5% 1/10W
R17	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R18	1-216-059-00	s METAL, CHIP 2.7K 5% 1/10W

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Ref. No. or Q'ty	Part No.	SP Description
R19	1-216-077-00	s METAL, CHIP 15K 5% 1/10W
R20	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R21	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R22	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R23	1-216-650-11	s METAL, CHIP 910 0.5% 1/10W
R24	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R25	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R26	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R27	1-216-045-00	s METAL, CHIP 680 5% 1/10W
R28	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R29	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R30	1-216-309-00	s METAL, CHIP 5.6 5% 1/10W
R31	1-216-309-00	s METAL, CHIP 5.6 5% 1/10W
R32	1-216-650-11	s METAL, CHIP 910 0.5% 1/10W
R33	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R34	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R35	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R36	1-216-674-11	s METAL, CHIP 9.1K 0.5% 1/10W
R37	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R38	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R39	1-216-077-00	s METAL, CHIP 15K 5% 1/10W
R40	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R42	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R43	1-216-009-00	s METAL, CHIP 22 5% 1/10W
R44	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R45	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R46	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R47	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R48	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R49	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R50	1-216-661-11	s METAL, CHIP 2.7K 0.5% 1/10W
R51	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R52	1-216-673-11	s METAL, CHIP 8.2K 0.5% 1/10W
R53	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R54	1-216-059-00	s METAL, CHIP 2.7K 5% 1/10W
R55	1-216-077-00	s METAL, CHIP 15K 5% 1/10W
R56	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R57	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R58	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R59	1-216-650-11	s METAL, CHIP 910 0.5% 1/10W
R60	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R61	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R62	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R63	1-216-045-00	s METAL, CHIP 680 5% 1/10W
R64	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R65	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R66	1-216-309-00	s METAL, CHIP 5.6 5% 1/10W
R67	1-216-309-00	s METAL, CHIP 5.6 5% 1/10W
R68	1-216-650-11	s METAL, CHIP 910 0.5% 1/10W
R69	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R70	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R71	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R72	1-216-674-11	s METAL, CHIP 9.1K 0.5% 1/10W
R73	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R74	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R75	1-216-077-00	s METAL, CHIP 15K 5% 1/10W
R76	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R78	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R79	1-216-009-00	s METAL, CHIP 22 5% 1/10W

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Ref. No. or Q'ty	Part No.	SP Description
R80	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R81	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R82	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R83	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R84	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R85	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R86	1-216-661-11	s METAL, CHIP 2.7K 0.5% 1/10W
R87	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R88	1-216-673-11	s METAL, CHIP 8.2K 0.5% 1/10W
R89	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R90	1-216-059-00	s METAL, CHIP 2.7K 5% 1/10W
R91	1-216-077-00	s METAL, CHIP 15K 5% 1/10W
R92	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R93	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R94	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R95	1-216-650-11	s METAL, CHIP 910 0.5% 1/10W
R96	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R97	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R98	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R99	1-216-045-00	s METAL, CHIP 680 5% 1/10W
R100	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R101	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R102	1-216-309-00	s METAL 5.6 5% 1/10W
R103	1-216-309-00	s METAL 5.6 5% 1/10W
R104	1-216-650-11	s METAL, CHIP 910 0.5% 1/10W
R105	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W
R106	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R107	1-216-659-11	s METAL, CHIP 2.2K 0.5% 1/10W
R108	1-216-674-11	s METAL, CHIP 9.1K 0.5% 1/10W
R109	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R110	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R111	1-216-077-00	s METAL, CHIP 15K 5% 1/10W
R116	1-216-077-00	s METAL, CHIP 15K 5% 1/10W
R118	1-216-077-00	s METAL, CHIP 15K 5% 1/10W
R120	1-216-077-00	s METAL, CHIP 15K 5% 1/10W
R122	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R129	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R130	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R131	1-216-121-91	s METAL 1M 5% 1/10W
R135	1-216-643-11	s METAL, CHIP 470 0.5% 1/10W
R137	1-216-667-11	s METAL, CHIP 4.7K 0.5% 1/10W
R139	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R140	1-216-669-11	s METAL, CHIP 5.6K 0.5% 1/10W
R141	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R142	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R146	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R147	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R148	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R150	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R152	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R153	1-215-907-11	s METAL 22 5% 3W
R154	1-207-632-00	s WIREWOUND 47 10% 2W
R155	1-215-907-11	s METAL 22 5% 3W
R156	1-215-907-11	s METAL 22 5% 3W
R160	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R161	1-216-059-00	s METAL, CHIP 2.7K 5% 1/10W
R170	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R171	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R172	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W

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Ref. No. or Q'ty	Part No.	SP Description
R173	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R174	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R175	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R176	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R177	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R178	1-216-637-11	s METAL, CHIP 270 0.5% 1/10W
R179	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R180	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R181	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R182	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R183	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R184	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R185	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R186	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R187	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R188	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R189	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R190	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R191	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R192	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R193	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R194	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R195	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R196	1-216-637-11	s METAL, CHIP 270 0.5% 1/10W
R197	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R198	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R199	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R200	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R201	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R210	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R211	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R212	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R213	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R214	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R215	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R216	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R217	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R218	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R219	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R220	1-216-637-11	s METAL, CHIP 270 0.5% 1/10W
R221	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R222	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R223	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R230	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R231	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R232	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R233	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R300	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R301	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R302	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R303	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R304	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R305	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R306	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R307	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R308	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R309	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R310	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R311	1-216-073-00	s METAL, CHIP 10K 5% 1/10W

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Ref. No. or Q'ty	Part No.	SP Description
R312	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R313	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R314	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R315	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R316	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R317	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R318	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R319	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R320	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R321	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R322	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R323	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R510	1-216-121-91	s METAL 1M 5% 1/10W
R530	1-216-061-00	s METAL, CHIP 3.3K 5% 1/10W
R531	1-216-634-11	s METAL, CHIP 200 0.5% 1/10W
R532	1-216-634-11	s METAL, CHIP 200 0.5% 1/10W
R533	1-216-634-11	s METAL, CHIP 200 0.5% 1/10W
R534	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R535	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R536	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R537	1-216-043-00	s METAL, CHIP 560 5% 1/10W
R538	1-216-051-00	s METAL, CHIP 1.2K 5% 1/10W
R539	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R540	1-216-055-00	s METAL, CHIP 1.8K 5% 1/10W
R541	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R542	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R543	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R544	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R545	1-216-043-00	s METAL, CHIP 560 5% 1/10W
R546	1-216-051-00	s METAL, CHIP 1.2K 5% 1/10W
R547	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R548	1-216-055-00	s METAL, CHIP 1.8K 5% 1/10W
R549	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R550	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R551	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R552	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R553	1-216-043-00	s METAL, CHIP 560 5% 1/10W
R554	1-216-051-00	s METAL, CHIP 1.2K 5% 1/10W
R555	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R556	1-216-055-00	s METAL, CHIP 1.8K 5% 1/10W
R557	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R559	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R560	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R561	1-216-089-91	s METAL 47K 5% 1/10W
R562	1-216-682-11	s METAL, CHIP 20K 0.5% 1/10W
R563	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R564	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R565	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R566	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R567	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R568	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R570	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R571	1-216-309-00	s METAL 5.6 5% 1/10W
R572	1-216-309-00	s METAL 5.6 5% 1/10W
R573	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R574	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R575	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R576	1-216-069-00	s METAL, CHIP 6.8K 5% 1/10W
R577	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W

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Ref. No. or Q'ty	Part No.	SP Description
R578	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R579	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R580	1-216-061-00	s METAL, CHIP 3.3K 5% 1/10W
R581	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R583	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R584	1-216-309-00	s METAL 5.6 5% 1/10W
R585	1-216-309-00	s METAL 5.6 5% 1/10W
R586	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R587	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R588	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R589	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R590	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R591	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R592	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R594	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R595	1-216-309-00	s METAL 5.6 5% 1/10W
R596	1-216-309-00	s METAL 5.6 5% 1/10W
R597	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R598	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R599	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R600	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R601	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R602	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R603	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R604	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R605	1-216-309-00	s METAL 5.6 5% 1/10W
R606	1-216-309-00	s METAL 5.6 5% 1/10W
R607	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R608	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R609	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R610	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R611	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R612	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R613	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R614	1-216-309-00	s METAL 5.6 5% 1/10W
R615	1-216-309-00	s METAL 5.6 5% 1/10W
R616	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R617	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R618	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R619	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R620	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R621	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R622	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R623	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R624	1-216-041-00	s METAL, CHIP 470 5% 1/10W
R625	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R626	1-216-309-00	s METAL 5.6 5% 1/10W
R627	1-216-309-00	s METAL 5.6 5% 1/10W
R628	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R629	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R630	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R631	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R632	1-216-653-11	s METAL, CHIP 1.2K 0.5% 1/10W
R633	1-216-665-11	s METAL, CHIP 3.9K 0.5% 1/10W
R634	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R635	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R636	1-216-041-00	s METAL, CHIP 470 5% 1/10W
R637	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R638	1-216-309-00	s METAL 5.6 5% 1/10W

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Ref. No. or Q'ty	Part No.	SP Description
R639	1-216-309-00	s METAL, 5.6 5% 1/10W
R640	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R641	1-216-081-00	s METAL, CHIP 22K 5% 1/10W
R642	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R643	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R644	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R645	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R646	1-216-309-00	s METAL, 5.6 5% 1/10W
R647	1-216-309-00	s METAL, 5.6 5% 1/10W
R648	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R649	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R651	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R652	1-216-063-91	s METAL, 3.9K 5% 1/10W
R653	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R660	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R661	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R662	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R663	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R664	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R665	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R666	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R667	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R668	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R669	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R670	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R671	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R672	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R673	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R674	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R675	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R676	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R677	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R678	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R679	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R680	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R681	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R682	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R683	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R684	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R685	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R686	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R687	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R688	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R689	1-216-029-00	s METAL, CHIP 150 5% 1/10W
R690	1-216-697-91	s METAL, CHIP 82K 0.50% 1/10W
R691	1-216-697-91	s METAL, CHIP 82K 0.50% 1/10W
R692	1-216-697-91	s METAL, CHIP 82K 0.50% 1/10W
R700	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R701	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R702	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R703	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R704	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R705	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R706	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
RV100	1-238-852-11	s RES, ADJ, CERMET 470
RV101	1-238-852-11	s RES, ADJ, CERMET 470
RV102	1-238-852-11	s RES, ADJ, CERMET 470
RV301	1-238-853-11	s RES, ADJ, METAL 1K
RV302	1-238-852-11	s RES, ADJ, CERMET 470

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Ref. No. or Q'ty	Part No.	SP Description
RV303	1-238-852-11	s RES, ADJ, CERMET 470
RV304	1-238-852-11	s RES, ADJ, CERMET 470
RV305	1-238-853-11	s RES, ADJ, METAL 1K
RV306	1-238-853-11	s RES, ADJ, METAL 1K
RV307	1-238-853-11	s RES, ADJ, METAL 1K
RV308	1-238-853-11	s RES, ADJ, METAL 1K
RV309	1-238-854-11	s RES, ADJ, METAL 2.2K
RV310	1-238-854-11	s RES, ADJ, METAL 2.2K
RV311	1-238-854-11	s RES, ADJ, METAL 2.2K
RV312	1-238-853-11	s RES, ADJ, METAL 1K
RV313	1-238-857-11	s RES, ADJ, CERMET 22K
RV314	1-238-857-11	s RES, ADJ, CERMET 22K
RV315	1-238-857-11	s RES, ADJ, CERMET 22K
S1	1-571-120-11	s SWITCH, SLIDE
X1	1-579-738-21	s VIBRATOR, CRYSTAL 14.318182MHz
X2	1-760-274-11	s OSCILLATOR, CRYSTAL 24.576MHz
X301	1-579-738-21	s VIBRATOR, CRYSTAL 14.318182MHz

AT-115 BOARD

Ref. No.

or Q'ty Part No. SP Description

1pc A-8313-839-A o MOUNTED CIRCUIT BOARD, AT-115

C1	1-104-914-11	s TANTALUM 22uF 20% 16V
C2	1-164-156-11	s CERAMIC 0.1uF 25V
C3	1-164-156-11	s CERAMIC 0.1uF 25V
C4	1-113-991-11	s TANTAL 33uF 20% 16V
C5	1-113-991-11	s TANTAL 33uF 20% 16V
C6	1-113-991-11	s TANTAL 33uF 20% 16V
C7	1-164-156-11	s CERAMIC 0.1uF 25V
C8	1-164-156-11	s CERAMIC 0.1uF 25V
C9	1-107-826-11	s CERAMIC 0.1uF 10% 16V
C10	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C11	1-164-156-11	s CERAMIC 0.1uF 25V
C12	1-104-852-11	s TANTALUM, CHIP 22uF 20% 10V
C13	1-104-852-11	s TANTALUM, CHIP 22uF 20% 10V
C14	1-164-156-11	s CERAMIC 0.1uF 25V
C15	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C16	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C17	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C18	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C19	1-164-156-11	s CERAMIC 0.1uF 25V
C20	1-104-914-11	s TANTALUM 22uF 20% 16V
C21	1-104-852-11	s TANTALUM, CHIP 22uF 20% 10V
C22	1-164-156-11	s CERAMIC 0.1uF 25V
C23	1-107-826-11	s CERAMIC 0.1uF 10% 16V
C24	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C25	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C26	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C27	1-104-852-11	s TANTALUM, CHIP 22uF 20% 10V
C28	1-164-156-11	s CERAMIC 0.1uF 25V
C29	1-164-156-11	s CERAMIC 0.1uF 25V
C30	1-104-823-11	s TANTALUM, CHIP 47uF 20% 16V
C31	1-164-156-11	s CERAMIC 0.1uF 25V
C32	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C33	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C34	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C35	1-162-957-11	s CERAMIC 220PF 5% 50V
C36	1-164-156-11	s CERAMIC 0.1uF 25V
C37	1-113-682-11	s TANTALUM 33uF 20% 10V
C38	1-164-156-11	s CERAMIC 0.1uF 25V
C39	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C40	1-164-156-11	s CERAMIC 0.1uF 25V
C41	1-164-156-11	s CERAMIC 0.1uF 25V
C42	1-113-682-11	s TANTALUM 33uF 20% 10V
C43	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C44	1-164-156-11	s CERAMIC 0.1uF 25V
C45	1-113-682-11	s TANTALUM 33uF 20% 10V
C46	1-164-156-11	s CERAMIC 0.1uF 25V
C47	1-164-156-11	s CERAMIC 0.1uF 25V
C48	1-135-210-11	s TANTALUM 4.7uF 10% 10V
C49	1-162-918-11	s CERAMIC, CHIP 18PF 5% 50V
C50	1-162-918-11	s CERAMIC, CHIP 18PF 5% 50V
C51	1-164-156-11	s CERAMIC 0.1uF 25V
C52	1-113-682-11	s TANTALUM 33uF 20% 10V
C53	1-164-156-11	s CERAMIC 0.1uF 25V
C54	1-113-682-11	s TANTALUM 33uF 20% 10V
C55	1-164-156-11	s CERAMIC 0.1uF 25V
C56	1-164-156-11	s CERAMIC 0.1uF 25V
C57	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V

(AT-115 BOARD)

Ref. No.

or Q'ty Part No. SP Description

CN1	1-691-542-21	s CONNECTOR, BOARD TO BOARD 48P
CN2	1-580-756-21	o PIN, CONNECTOR 7P
D1	8-719-105-91	s DIODE RD5.6M-B2
D2	8-719-024-81	s DIODE 1SS300-TE85L
D3	8-719-024-81	s DIODE 1SS300-TE85L
D4	8-719-800-76	s DIODE 1SS226
D5	8-719-800-76	s DIODE 1SS226
D6	8-719-024-81	s DIODE 1SS300-TE85L
D7	8-719-024-81	s DIODE 1SS300-TE85L
IC1	8-759-066-61	s IC TC4053BFS
IC2	8-759-082-61	s IC TC4W53FU
IC3	8-759-173-16	s IC TL062CPW
IC5	8-759-700-07	s IC NJM2903M
IC6	8-759-209-90	s IC TC4S71F
IC7	8-759-173-16	s IC TL062CPW
IC8	8-759-989-91	s IC TL7705ACPS
IC9	8-759-925-74	s IC SN74HC04ANS
IC10	8-759-461-96	s IC UPD78P218AGC-AB8-S10V1.00
IC11	8-759-635-27	s IC M62352GP
IC12	8-759-551-68	s IC M6M80021FP
IC13	8-759-054-56	s IC SN75179BPS
IC14	8-759-082-61	s IC TC4W53FU
Q1	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q2	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q3	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q4	8-729-905-35	s TRANSISTOR 2SC4081R
Q5	8-729-907-00	s TRANSISTOR DTC114EU
Q6	8-729-402-19	s TRANSISTOR XN6501
Q7	8-729-402-19	s TRANSISTOR XN6501
Q8	8-729-905-35	s TRANSISTOR 2SC4081R
Q9	8-729-402-84	s TRANSISTOR XN4601
Q10	8-729-402-84	s TRANSISTOR XN4601
Q11	8-729-109-44	s TRANSISTOR 2SK94
Q12	8-729-905-35	s TRANSISTOR 2SC4081R
Q13	8-729-905-35	s TRANSISTOR 2SC4081R
Q14	8-729-402-84	s TRANSISTOR XN4601
Q15	8-729-402-19	s TRANSISTOR XN6501
Q16	8-729-403-32	s TRANSISTOR XN6534
Q17	8-729-143-13	s TRANSISTOR 2SC4176-B34
Q18	8-729-028-73	s TRANSISTOR DTA114EUA-T106
Q19	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q20	8-729-028-73	s TRANSISTOR DTA114EUA-T106
Q21	8-729-800-37	s TRANSISTOR 2SD1048-X7
Q22	8-729-807-87	s TRANSISTOR 2SB1295-UL6
R1	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R2	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R3	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R4	1-216-830-11	s METAL, CHIP 5.6K 5% 1/16W
R5	1-216-830-11	s METAL, CHIP 5.6K 5% 1/16W
R6	1-216-830-11	s METAL, CHIP 5.6K 5% 1/16W
R7	1-216-830-11	s METAL, CHIP 5.6K 5% 1/16W
R8	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R9	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R10	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R11	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R12	1-216-833-11	s METAL, CHIP 10K 5% 1/16W

(AT-115 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R13	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R14	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R15	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R16	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R17	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R18	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R19	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R20	1-216-819-11	s METAL, CHIP 680 5% 1/16W
R21	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R22	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R23	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R24	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R25	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R26	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R27	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R28	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R29	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R30	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R31	1-216-814-11	s METAL, CHIP 270 5% 1/16W
R32	1-216-814-11	s METAL, CHIP 270 5% 1/16W
R33	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R34	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R36	1-216-832-11	s METAL, CHIP 8.2K 5% 1/16W
R37	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R38	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R39	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R40	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R41	1-218-716-11	s METAL 10K 0.50% 1/16W
R42	1-218-716-11	s METAL 10K 0.50% 1/16W
R43	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R44	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R45	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R46	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R47	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R48	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R49	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R50	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R51	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R52	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R53	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R54	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R55	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R56	1-216-830-11	s METAL, CHIP 5.6K 5% 1/16W
R57	1-216-824-11	s METAL, CHIP 1.8K 5% 1/16W
R58	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R59	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R60	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R61	1-216-832-11	s METAL, CHIP 8.2K 5% 1/16W
R62	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R63	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R64	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R65	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R66	1-216-832-11	s METAL, CHIP 8.2K 5% 1/16W
R67	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R68	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R69	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R70	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R71	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R72	1-216-813-11	s METAL, CHIP 220 5% 1/16W

(AT-115 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R73	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R74	1-218-716-11	s METAL 10K 0.50% 1/16W
R75	1-216-021-00	s METAL, CHIP 68 5% 1/10W
R76	1-216-021-00	s METAL, CHIP 68 5% 1/10W
R77	1-216-021-00	s METAL, CHIP 68 5% 1/10W
R78	1-216-021-00	s METAL, CHIP 68 5% 1/10W
R79	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R80	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R81	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R82	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R83	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R84	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R85	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R86	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R87	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R88	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R89	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R90	1-216-812-11	s METAL, CHIP 180 5% 1/16W
R91	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R92	1-259-880-11	s CARBON 2.2M 5% 1/4W
SE1	8-749-013-46	s IC RPI-1020
X1	1-760-592-21	s VIBRATOR, CRYSTAL (SMD) 9.8304MHZ

CN-1395 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C201	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C202	1-164-156-11	s CERAMIC 0.1uF 25V
C203	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C204	1-164-156-11	s CERAMIC 0.1uF 25V
CN202	1-764-080-21	s PIN, CONNECTOR (PC BOARD) 8P
D201	8-719-158-15	s DIODE RD5.6SB
D202	8-719-024-81	s DIODE 1SS300-TE85L
D203	8-719-158-15	s DIODE RD5.6SB
D204	8-719-158-55	s DIODE RD15SB
IC201	8-759-518-85	s IC S16MD01
L201	1-412-031-11	s INDUCTOR CHIP 47uH
Q201	8-729-029-14	s TRANSISTOR DTC144EUA-T106
R201	1-216-813-11	s METAL, CHIP 220 5% 1/16W

CN-1396 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8313-454-A	o MOUNTED CIRCUIT BOARD, CN-1396
1pc	3-184-116-01	s INSULATOR, SOCKET
2pcs	7-621-772-10	s SCREW +B 2X4
4pcs	7-621-770-87	s SCREW +B 2.6X5
4pcs	7-685-546-14	s SCREW +BTP 3X8 TYPE2 N-S
C102	1-163-038-91	s CERAMIC 0.1uF 25V
C103	1-110-569-11	s TANTAL 47uF 20% 6.3V
C104	1-163-259-91	s CERAMIC 220PF 5% 50V
C105	1-163-259-91	s CERAMIC 220PF 5% 50V
CN102	1-691-865-11	s CONNECTOR, SQUARE TYPE 50P
CN103	1-691-865-11	s CONNECTOR, SQUARE TYPE 50P
CN104	1-695-581-11	s CONNECTOR, D- SUB
CN107	1-566-728-21	s TERMINAL, S
CN108	1-770-081-12	s CONNECTOR, BNC
CN109	1-750-668-11	s CONNECTOR, BNC
CN110	1-540-256-21	s SOCKET, SYNCHRONIZE
D102	8-719-106-43	s DIODE RD9.1M-B1
D107	8-719-106-43	s DIODE RD9.1M-B1
D108	8-719-106-43	s DIODE RD9.1M-B1
D109	8-719-106-43	s DIODE RD9.1M-B1
D110	8-719-106-43	s DIODE RD9.1M-B1
D111	8-719-106-43	s DIODE RD9.1M-B1
D112	8-719-106-43	s DIODE RD9.1M-B1
D113	8-719-106-43	s DIODE RD9.1M-B1
D114	8-719-106-43	s DIODE RD9.1M-B1
D115	8-719-106-43	s DIODE RD9.1M-B1
D116	8-719-106-43	s DIODE RD9.1M-B1
D117	8-719-106-43	s DIODE RD9.1M-B1
D118	8-719-106-43	s DIODE RD9.1M-B1
D119	8-719-106-43	s DIODE RD9.1M-B1
D120	8-719-106-43	s DIODE RD9.1M-B1
FL102	1-233-283-11	s FILTER, EMI (SMD)
FL107	1-233-283-11	s FILTER, EMI (SMD)
FL108	1-233-283-11	s FILTER, EMI (SMD)
FL109	1-233-283-11	s FILTER, EMI (SMD)
FL110	1-233-283-11	s FILTER, EMI (SMD)
FL111	1-233-283-11	s FILTER, EMI (SMD)
FL112	1-233-283-11	s FILTER, EMI (SMD)
FL113	1-233-283-11	s FILTER, EMI (SMD)
FL114	1-233-283-11	s FILTER, EMI (SMD)
FL115	1-233-283-11	s FILTER, EMI (SMD)
FL116	1-233-283-11	s FILTER, EMI (SMD)
FL117	1-233-283-11	s FILTER, EMI (SMD)
FL118	1-233-283-11	s FILTER, EMI (SMD)
FL119	1-233-283-11	s FILTER, EMI (SMD)
J101	1-507-792-00	s JACK
SW101	1-516-925-21	s SWITCH, DIP 8-CKT

CN-1401 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8313-449-A	o MOUNTED CIRCUIT BOARD, CN-1401
CN101	1-573-806-21	s CONNECTOR (1.5MM) (SMD) 6P MALE
CN102	1-562-221-51	s CONNECTOR, FEMALE, 12P
D101	8-719-158-55	s DIODE RD15SB
D102	8-719-158-55	s DIODE RD15SB
D103	8-719-158-55	s DIODE RD15SB
D104	8-719-158-55	s DIODE RD15SB
D105	8-719-158-55	s DIODE RD15SB
FL101	1-239-400-11	s FILTER, CHIP EMI
FL102	1-239-400-11	s FILTER, CHIP EMI
FL103	1-239-400-11	s FILTER, CHIP EMI
FL104	1-239-400-11	s FILTER, CHIP EMI

CN-1462 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C301	1-164-156-11	s CERAMIC 0.1uF 25V
C302	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
C303	1-164-156-11	s CERAMIC 0.1uF 25V
CN301	1-695-209-21	s PIN, CONNECTOR (PC BOARD) 15P
D301	8-719-158-15	s DIODE RD5.6SB
D302	8-719-158-15	s DIODE RD5.6SB
D303	8-719-158-15	s DIODE RD5.6SB
D304	8-719-158-15	s DIODE RD5.6SB
D305	8-719-158-15	s DIODE RD5.6SB
D306	8-719-158-15	s DIODE RD5.6SB
D307	8-719-158-15	s DIODE RD5.6SB
D308	8-719-158-15	s DIODE RD5.6SB
D309	8-719-158-15	s DIODE RD5.6SB
D310	8-719-158-15	s DIODE RD5.6SB
D311	8-719-158-15	s DIODE RD5.6SB
D312	8-719-158-15	s DIODE RD5.6SB
L301	1-412-031-11	s INDUCTOR CHIP 47uH

LED-280 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-665-437-11	o PRINTED CIRCUIT BOARD, LED-280
1pc	3-174-895-01	o HOLDER, LED
CN201	1-506-481-11	s CONNECTOR, 2P, MALE
D201	8-719-920-05	s SLP281C-50

MB-724 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8313-838-A	o MOUNTED CIRCUIT BOARD, MB-724
1pc	1-475-162-11	s CONVERTER UNIT, DC-DC
C201	1-113-682-11	s TANTALUM 33uF 20% 10V
C202	1-164-156-11	s CERAMIC 0.1uF 25V
C203	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C204	1-107-689-21	s TANTALUM 1uF 20% 35V
C205	1-162-964-11	s CERAMIC 0.001uF 10% 50V
C206	1-162-907-11	s CERAMIC, CHIP 2PF 50V
C208	1-104-852-11	s TANTALUM, CHIP 22uF 20% 10V
C209	1-104-852-11	s TANTALUM, CHIP 22uF 20% 10V
C210	1-164-156-11	s CERAMIC 0.1uF 25V
C211	1-113-682-11	s TANTALUM 33uF 20% 10V
C212	1-135-210-11	s TANTALUM 4.7uF 10% 10V
C213	1-135-210-11	s TANTALUM 4.7uF 10% 10V
C214	1-107-854-11	s TANTALUM 68uF 20% 6.3V
C215	1-135-210-11	s TANTALUM 4.7uF 10% 10V
C218	1-164-156-11	s CERAMIC 0.1uF 25V
C219	1-113-682-11	s TANTALUM 33uF 20% 10V
C220	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
CN201	1-766-431-21	o HOUSING, CONNECTOR 30P
CN202	1-691-942-31	o CONNECTOR, BOARD TO BOARD 30P
CN203	1-573-806-21	s CONNECTOR (1.5MM) (SMD) 6P MALE
CN204	1-691-520-11	s CONNECTOR, BOARD TO BOARD 48P
CN206	1-695-209-21	s PIN, CONNECTOR (PC BOARD) 15P
CN207	1-764-080-21	s PIN, CONNECTOR (PC BOARD) 8P
CN208	1-564-704-11	s CONNECOR, 2P, MALE
CN209	1-766-383-11	o CONNECTOR (1.5MM) (SMD) 12P MALE
CN210	1-766-382-11	o CONNECTOR (1.5MM) (SMD) 10P MALE
D201	8-719-105-51	s DIODE RD3.6M-B1
FL201	1-239-400-11	s FILTER, CHIP EMI
FL202	1-239-400-11	s FILTER, CHIP EMI
FL203	1-239-400-11	s FILTER, CHIP EMI
FL204	1-239-400-11	s FILTER, CHIP EMI
FL205	1-239-400-11	s FILTER, CHIP EMI
FL206	1-239-400-11	s FILTER, CHIP EMI
FL207	1-239-400-11	s FILTER, CHIP EMI
FL208	1-239-400-11	s FILTER, CHIP EMI
FL209	1-239-400-11	s FILTER, CHIP EMI
FL210	1-239-400-11	s FILTER, CHIP EMI
FL211	1-239-400-11	s FILTER, CHIP EMI
IC201	8-752-067-96	s IC CX20095A-TH
IC202	8-759-234-20	s IC TC7S08F
L1	1-412-031-11	s INDUCTOR CHIP 47uH
L2	1-412-031-11	s INDUCTOR CHIP 47uH
Q201	8-729-905-36	s TRANSISTOR 2SC4081-S
Q202	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q203	8-729-905-36	s TRANSISTOR 2SC4081-S
Q204	8-729-905-36	s TRANSISTOR 2SC4081-S
Q205	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q206	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q207	8-729-905-36	s TRANSISTOR 2SC4081-S
Q208	8-729-905-36	s TRANSISTOR 2SC4081-S
Q209	8-729-905-36	s TRANSISTOR 2SC4081-S
Q210	8-729-905-36	s TRANSISTOR 2SC4081-S
Q211	8-729-905-36	s TRANSISTOR 2SC4081-S

(MB-724 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R201	1-218-665-11	s METAL 75 0.50% 1/16W
R202	1-216-003-11	s METAL, CHIP 12 5% 1/10W
R203	1-216-819-11	s METAL, CHIP 680 5% 1/16W
R204	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R205	1-216-828-11	s METAL, CHIP 3.9K 5% 1/16W
R206	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R207	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R208	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R209	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R210	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R211	1-218-665-11	s METAL 75 0.50% 1/16W
R212	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R213	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R214	1-218-665-11	s METAL 75 0.50% 1/16W
R215	1-218-665-11	s METAL 75 0.50% 1/16W
R216	1-216-832-11	s METAL, CHIP 8.2K 5% 1/16W
R217	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R218	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R219	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R220	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R221	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R222	1-216-820-11	s METAL, CHIP 820 5% 1/16W
R223	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R224	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R225	1-216-832-11	s METAL, CHIP 8.2K 5% 1/16W
R226	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R227	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R228	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R229	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R230	1-218-665-11	s METAL 75 0.50% 1/16W
R231	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R232	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R235	1-218-665-11	s METAL 75 0.50% 1/16W
R236	1-216-815-11	s METAL, CHIP 330 5% 1/16W
R237	1-216-815-11	s METAL, CHIP 330 5% 1/16W
R238	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R239	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R240	1-216-832-11	s METAL, CHIP 8.2K 5% 1/16W
R241	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R242	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R243	1-218-665-11	s METAL 75 0.50% 1/16W
R244	1-216-821-11	s METAL, CHIP 1K 5% 1/16W

MB-725 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8313-453-A	o MOUNTED CIRCUIT BOARD, MB-725
C1	1-163-038-91	s CERAMIC 0.1uF 25V
C2	1-163-038-91	s CERAMIC 0.1uF 25V
C3	1-126-936-11	s ELECT 3300uF 20% 16V
CN1	1-778-258-11	o CONNECTOR, BOARD TO BOARD 124P
CN2	1-778-258-11	o CONNECTOR, BOARD TO BOARD 124P
CN5	1-770-291-11	o PIN, CONNECTOR (PC BOARD) 7P
CN7	1-764-101-11	s PIN, CONNECTOR (PC BOARD) 2P
CN8	1-506-487-11	s CONNECTOR, 8P, MALE
CN9	1-506-491-11	s CONNECTOR, 12P, MALE
CN10	1-564-505-11	s PLUG, CONNECTOR 2P
D1	8-719-800-76	s DIODE 1SS226
F1	Δ 1-532-747-11	s FUSE, GLASS TUBE 5A 125V
FH1	1-533-189-11	s HOLDER, FUSE
FH2	1-533-189-11	s HOLDER, FUSE
FL1	1-421-773-11	s FILTER, NOISE REMOVAL
IC1	8-759-518-85	s IC S16MD01
Q1	8-729-027-56	s TRANSISTOR DTC143TKA
Q2	8-729-027-56	s TRANSISTOR DTC143TKA
R1	1-216-033-00	s METAL, CHIP 220 5% 1/10W
RY1	1-515-648-11	s RELAY, POWER (DS)

PA-200 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C100	1-113-642-11	s TANTAL 47uF 20% 10V
C101	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C102	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C103	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C104	1-113-981-11	s TANTALUM 22uF 20% 20V
C105	1-107-687-11	s TANTALUM 3.3uF 20% 20V
C106	1-113-981-11	s TANTALUM 22uF 20% 20V
C107	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C108	1-113-642-11	s TANTAL 47uF 20% 10V
C109	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C110	1-113-642-11	s TANTAL 47uF 20% 10V
C111	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
CN100	1-764-082-21	s PIN, CONNECTOR (PC BOARD) 11P
CN101	1-580-055-21	s PIN, CONNECTOR 2P
CN102	1-764-081-21	s PIN, CONNECTOR (PC BOARD) 9P
D101	8-719-159-10	s DIODE RD5.1SB-T2
IC101	8-759-031-84	s IC SC7S04F
IC102	8-759-031-84	s IC SC7S04F
IC103	8-752-052-72	s IC CXA1439M
L100	1-408-789-21	s INDUCTOR CHIP 100uH
L101	1-408-789-21	s INDUCTOR CHIP 100uH
L102	1-408-789-21	s INDUCTOR CHIP 100uH
Q100	8-729-926-19	s TRANSISTOR 2SC4103-Q
R100	1-216-041-00	s METAL, CHIP 470 5% 1/10W
R101	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R102	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R103	1-216-809-11	s METAL, CHIP 100 5% 1/16W

PA-201 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C200	1-113-642-11	s TANTAL 47uF 20% 10V
C201	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C202	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C203	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C204	1-113-981-11	s TANTALUM 22uF 20% 20V
C205	1-107-687-11	s TANTALUM 3.3uF 20% 20V
C206	1-113-981-11	s TANTALUM 22uF 20% 20V
C207	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C208	1-113-642-11	s TANTAL 47uF 20% 10V
C209	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C210	1-113-642-11	s TANTAL 47uF 20% 10V
C211	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
CN200	1-764-082-21	s PIN, CONNECTOR (PC BOARD) 11P
CN201	1-580-055-21	s PIN, CONNECTOR 2P
CN202	1-764-081-21	s PIN, CONNECTOR (PC BOARD) 9P
D201	8-719-159-10	s DIODE RD5.1SB-T2
IC201	8-759-031-84	s IC SC7S04F
IC202	8-759-031-84	s IC SC7S04F
IC203	8-752-052-72	s IC CXA1439M
L200	1-408-789-21	s INDUCTOR CHIP 100uH
L201	1-408-789-21	s INDUCTOR CHIP 100uH
L202	1-408-789-21	s INDUCTOR CHIP 100uH
Q200	8-729-926-19	s TRANSISTOR 2SC4103-Q
R200	1-216-041-00	s METAL, CHIP 470 5% 1/10W
R201	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R202	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R203	1-216-809-11	s METAL, CHIP 100 5% 1/16W

PA-202 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C300	1-113-642-11	s TANTAL 47uF 20% 10V
C301	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C302	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C303	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C304	1-113-981-11	s TANTALUM 22uF 20% 20V
C305	1-107-687-11	s TANTALUM 3.3uF 20% 20V
C306	1-113-981-11	s TANTALUM 22uF 20% 20V
C307	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C308	1-113-642-11	s TANTAL 47uF 20% 10V
C309	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C310	1-113-642-11	s TANTAL 47uF 20% 10V
C311	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
CN301	1-695-320-31	o CONNECTOR (1.5MM) (SMD) 2P MALE
D301	8-719-159-10	s DIODE RD5.1SB-T2
IC301	8-759-031-84	s IC SC7S04F
IC302	8-759-031-84	s IC SC7S04F
IC303	8-752-052-72	s IC CXA1439M
L300	1-408-789-21	s INDUCTOR CHIP 100uH
L301	1-408-789-21	s INDUCTOR CHIP 100uH
L302	1-408-789-21	s INDUCTOR CHIP 100uH
Q300	8-729-926-19	s TRANSISTOR 2SC4103-Q
R300	1-216-041-00	s METAL, CHIP 470 5% 1/10W
R301	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R302	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R303	1-216-809-11	s METAL, CHIP 100 5% 1/16W

PR-228 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8313-463-A	o MOUNTED CIRCUIT BOARD, PR-228
C1	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C2	1-126-395-11	s ELECT, CHIP 22uF 20% 16V
C3	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C4	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C5	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C6	1-164-156-11	s CERAMIC 0.1uF 25V
C7	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C8	1-107-689-21	s TANTALUM 1uF 20% 35V
C9	1-135-072-21	s TANTALUM, CHIP 0.22uF 10% 35V
C10	1-107-689-21	s TANTALUM 1uF 20% 35V
C11	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C12	1-107-689-21	s TANTALUM 1uF 20% 35V
C13	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C14	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C15	1-104-752-11	s TANTALUM, CHIP 33uF 20% 6.3V
C16	1-104-752-11	s TANTALUM, CHIP 33uF 20% 6.3V
C17	1-164-156-11	s CERAMIC 0.1uF 25V
C18	1-104-752-11	s TANTALUM, CHIP 33uF 20% 6.3V
C19	1-164-156-11	s CERAMIC 0.1uF 25V
C101	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C103	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C104	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C105	1-164-156-11	s CERAMIC 0.1uF 25V
C106	1-164-156-11	s CERAMIC 0.1uF 25V
C108	1-135-180-21	s TANTALUM, CHIP 3.3uF 20% 6.3V
C109	1-164-156-11	s CERAMIC 0.1uF 25V
C110	1-164-156-11	s CERAMIC 0.1uF 25V
C111	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C112	1-164-156-11	s CERAMIC 0.1uF 25V
C113	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C115	1-164-156-11	s CERAMIC 0.1uF 25V
C117	1-164-156-11	s CERAMIC 0.1uF 25V
C118	1-135-180-21	s TANTALUM, CHIP 3.3uF 20% 6.3V
C119	1-135-180-21	s TANTALUM, CHIP 3.3uF 20% 6.3V
C120	1-164-156-11	s CERAMIC 0.1uF 25V
C121	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C123	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C126	1-164-315-11	s CERAMIC 470PF 5% 50V
C127	1-104-563-11	s FILM, CHIP 0.1uF 5% 16V
C129	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C130	1-107-826-11	s CERAMIC 0.1uF 10% 16V
C201	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C203	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C204	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C205	1-164-156-11	s CERAMIC 0.1uF 25V
C206	1-164-156-11	s CERAMIC 0.1uF 25V
C208	1-135-180-21	s TANTALUM, CHIP 3.3uF 20% 6.3V
C209	1-164-156-11	s CERAMIC 0.1uF 25V
C210	1-164-156-11	s CERAMIC 0.1uF 25V
C211	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C212	1-164-156-11	s CERAMIC 0.1uF 25V
C213	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C215	1-164-156-11	s CERAMIC 0.1uF 25V
C217	1-164-156-11	s CERAMIC 0.1uF 25V
C218	1-135-180-21	s TANTALUM, CHIP 3.3uF 20% 6.3V
C219	1-135-180-21	s TANTALUM, CHIP 3.3uF 20% 6.3V
C220	1-164-156-11	s CERAMIC 0.1uF 25V

(PR-228 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C221	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C225	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C226	1-164-315-11	s CERAMIC 470PF 5% 50V
C227	1-104-563-11	s FILM, CHIP 0.1uF 5% 16V
C229	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C230	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C231	1-107-826-11	s CERAMIC 0.1uF 10% 16V
C301	1-164-156-11	s CERAMIC 0.1uF 25V
C302	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C304	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C305	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C306	1-164-156-11	s CERAMIC 0.1uF 25V
C307	1-164-156-11	s CERAMIC 0.1uF 25V
C309	1-135-180-21	s TANTALUM, CHIP 3.3uF 20% 6.3V
C310	1-164-156-11	s CERAMIC 0.1uF 25V
C311	1-164-156-11	s CERAMIC 0.1uF 25V
C312	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C313	1-164-156-11	s CERAMIC 0.1uF 25V
C314	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C316	1-164-156-11	s CERAMIC 0.1uF 25V
C318	1-164-156-11	s CERAMIC 0.1uF 25V
C319	1-135-180-21	s TANTALUM, CHIP 3.3uF 20% 6.3V
C320	1-135-180-21	s TANTALUM, CHIP 3.3uF 20% 6.3V
C321	1-164-156-11	s CERAMIC 0.1uF 25V
C322	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C326	1-164-315-11	s CERAMIC 470PF 5% 50V
C327	1-104-563-11	s FILM, CHIP 0.1uF 5% 16V
C329	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C330	1-107-826-11	s CERAMIC 0.1uF 10% 16V
C401	1-113-990-11	s TANTALUM 15uF 20% 16V
C402	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C403	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C406	1-113-990-11	s TANTALUM 15uF 20% 16V
C407	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C408	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C411	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C412	1-162-924-11	s CERAMIC 56PF 5% 50V
C413	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C414	1-165-176-11	s CERAMIC, CHIP 0.047uF 10% 16V
C415	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C416	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C417	1-164-156-11	s CERAMIC 0.1uF 25V
C418	1-162-920-11	s CERAMIC, CHIP 27PF 5% 50V
C420	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C421	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C422	1-104-752-11	s TANTALUM, CHIP 33uF 20% 6.3V
C423	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C424	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C501	1-113-990-11	s TANTALUM 15uF 20% 16V
C502	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C503	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C506	1-113-990-11	s TANTALUM 15uF 20% 16V
C507	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C508	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C511	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C512	1-162-924-11	s CERAMIC 56PF 5% 50V
C513	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C514	1-165-176-11	s CERAMIC, CHIP 0.047uF 10% 16V
C515	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V

(PR-228 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C516	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C517	1-162-920-11	s CERAMIC, CHIP 27PF 5% 50V
C518	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C520	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C521	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C522	1-104-752-11	s TANTALUM, CHIP 33uF 20% 6.3V
C523	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C524	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C601	1-113-990-11	s TANTALUM 15uF 20% 16V
C602	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C603	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C607	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C608	1-113-990-11	s TANTALUM 15uF 20% 16V
C609	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C612	1-107-685-11	s TANTALUM 15uF 20% 6.3V
C613	1-162-924-11	s CERAMIC 56PF 5% 50V
C614	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C615	1-165-176-11	s CERAMIC, CHIP 0.047uF 10% 16V
C616	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C617	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C618	1-162-920-11	s CERAMIC, CHIP 27PF 5% 50V
C619	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C620	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C621	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C622	1-104-752-11	s TANTALUM, CHIP 33uF 20% 6.3V
C623	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C624	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
CN1	1-691-943-41	o CONNECTOR, BOARD TO BOARD 30P
CN101	1-580-055-21	s PIN, CONNECTOR 2P
CN201	1-580-055-21	s PIN, CONNECTOR 2P
CN301	1-580-055-21	s PIN, CONNECTOR 2P
D1	8-719-157-20	s DIODE RD4.3M-B
D2	8-719-157-20	s DIODE RD4.3M-B
D401	8-719-947-01	s DIODE FMP1
D402	8-719-024-81	s DIODE 1SS300-TE85L
D501	8-719-947-01	s DIODE FMP1
D502	8-719-024-81	s DIODE 1SS300-TE85L
D601	8-719-947-01	s DIODE FMP1
D602	8-719-024-81	s DIODE 1SS300-TE85L
FL101	1-233-902-11	s FILTER, TRAP
FL201	1-233-902-11	s FILTER, TRAP
FL301	1-233-902-11	s FILTER, TRAP
IC1	8-759-031-84	s IC SC7S04F
IC2	8-759-234-20	s IC TC7S08F
IC3	8-759-031-84	s IC SC7S04F
IC5	8-759-076-06	s IC TL064CPW
IC6	8-759-234-20	s IC TC7S08F
IC101	8-759-066-59	s IC TC74HC4053AFS
IC102	8-752-068-64	s IC CXA1486Q-TH
IC103	8-759-173-16	s IC TL062CPW
IC104	8-759-066-59	s IC TC74HC4053AFS
IC105	8-759-635-27	s IC M62352GP
IC201	8-759-066-59	s IC TC74HC4053AFS
IC202	8-752-068-64	s IC CXA1486Q-TH
IC203	8-759-076-06	s IC TL064CPW
IC204	8-759-066-59	s IC TC74HC4053AFS
IC205	8-759-635-27	s IC M62352GP

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Ref. No. or Q'ty	Part No.	SP Description
IC301	8-759-066-59	s IC TC74HC4053AFS
IC302	8-752-068-64	s IC CXA1486Q-TH
IC304	8-759-173-16	s IC TL062CPW
IC305	8-759-066-59	s IC TC74HC4053AFS
IC306	8-759-635-27	s IC M62352GP
IC402	8-759-173-16	s IC TL062CPW
IC502	8-759-173-16	s IC TL062CPW
IC602	8-759-173-16	s IC TL062CPW
L1	1-408-781-00	s INDUCTOR CHIP 22uH
L2	1-408-781-00	s INDUCTOR CHIP 22uH
L102	1-410-389-31	s INDUCTOR CHIP 47uH
Q1	8-729-101-07	s TRANSISTOR 2SB798
Q2	8-729-807-51	s TRANSISTOR 2SD1623-S
Q3	8-729-101-07	s TRANSISTOR 2SB798
Q7	8-729-905-36	s TRANSISTOR 2SC4081-S
Q8	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q9	8-729-905-36	s TRANSISTOR 2SC4081-S
Q10	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q11	8-729-905-36	s TRANSISTOR 2SC4081-S
Q101	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q102	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q103	8-729-905-36	s TRANSISTOR 2SC4081-S
Q201	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q202	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q203	8-729-905-36	s TRANSISTOR 2SC4081-S
Q301	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q302	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q303	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q304	8-729-905-36	s TRANSISTOR 2SC4081-S
Q401	8-729-905-36	s TRANSISTOR 2SC4081-S
Q402	8-729-905-36	s TRANSISTOR 2SC4081-S
Q403	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q404	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q409	8-729-905-36	s TRANSISTOR 2SC4081-S
Q410	8-729-905-36	s TRANSISTOR 2SC4081-S
Q411	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q412	8-729-905-36	s TRANSISTOR 2SC4081-S
Q413	8-729-905-36	s TRANSISTOR 2SC4081-S
Q414	8-729-142-90	s TRANSISTOR 2SK853-K5
Q415	8-729-402-78	s TRANSISTOR XN6401
Q416	8-729-905-36	s TRANSISTOR 2SC4081-S
Q417	8-729-141-53	s TRANSISTOR 2SK94-X2X3X4
Q418	8-729-141-53	s TRANSISTOR 2SK94-X2X3X4
Q419	8-729-427-74	s TRANSISTOR XP4601
Q420	8-729-427-83	s TRANSISTOR XP6501
Q421	8-729-427-74	s TRANSISTOR XP4601
Q422	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q423	8-729-905-36	s TRANSISTOR 2SC4081-S
Q424	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q501	8-729-905-36	s TRANSISTOR 2SC4081-S
Q502	8-729-905-36	s TRANSISTOR 2SC4081-S
Q503	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q504	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q509	8-729-905-36	s TRANSISTOR 2SC4081-S
Q510	8-729-905-36	s TRANSISTOR 2SC4081-S
Q511	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q512	8-729-905-36	s TRANSISTOR 2SC4081-S
Q513	8-729-905-36	s TRANSISTOR 2SC4081-S

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Ref. No. or Q'ty	Part No.	SP Description
Q514	8-729-142-90	s TRANSISTOR 2SK853-K5
Q515	8-729-402-78	s TRANSISTOR XN6401
Q516	8-729-905-36	s TRANSISTOR 2SC4081-S
Q517	8-729-141-53	s TRANSISTOR 2SK94-X2X3X4
Q518	8-729-141-53	s TRANSISTOR 2SK94-X2X3X4
Q519	8-729-427-74	s TRANSISTOR XP4601
Q520	8-729-427-83	s TRANSISTOR XP6501
Q521	8-729-427-74	s TRANSISTOR XP4601
Q522	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q523	8-729-905-36	s TRANSISTOR 2SC4081-S
Q524	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q601	8-729-905-36	s TRANSISTOR 2SC4081-S
Q602	8-729-905-36	s TRANSISTOR 2SC4081-S
Q603	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q604	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q609	8-729-905-36	s TRANSISTOR 2SC4081-S
Q610	8-729-905-36	s TRANSISTOR 2SC4081-S
Q611	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q612	8-729-905-36	s TRANSISTOR 2SC4081-S
Q613	8-729-905-36	s TRANSISTOR 2SC4081-S
Q614	8-729-142-90	s TRANSISTOR 2SK853-K5
Q615	8-729-402-78	s TRANSISTOR XN6401
Q616	8-729-905-36	s TRANSISTOR 2SC4081-S
Q617	8-729-141-53	s TRANSISTOR 2SK94-X2X3X4
Q618	8-729-141-53	s TRANSISTOR 2SK94-X2X3X4
Q619	8-729-427-74	s TRANSISTOR XP4601
Q620	8-729-427-83	s TRANSISTOR XP6501
Q621	8-729-427-74	s TRANSISTOR XP4601
Q622	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q623	8-729-905-36	s TRANSISTOR 2SC4081-S
Q624	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
R1	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R2	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R3	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R4	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R5	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R6	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R7	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R8	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R9	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R10	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R11	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R18	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R23	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R24	1-218-708-11	s METAL 4.7K 0.50% 1/16W
R25	1-218-710-11	s METAL, CHIP 5.6K 0.50% 1/16W
R26	1-218-728-11	s METAL 33K 0.50% 1/16W
R27	1-218-722-11	s METAL, CHIP 18K 0.50% 1/16W
R29	1-218-725-11	s METAL 24K 0.50% 1/16W
R30	1-218-716-11	s METAL 10K 0.50% 1/16W
R37	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R38	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R39	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R40	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R41	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R42	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R43	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R44	1-216-837-11	s METAL, CHIP 22K 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R45	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R46	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R101	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R102	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R103	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R105	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R106	1-216-840-11	s METAL, CHIP 39K 5% 1/16W
R107	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R108	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R109	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R110	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R111	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R112	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R113	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R114	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R115	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R116	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R117	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R121	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R122	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R123	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R124	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R125	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R126	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R127	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R128	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R129	1-216-824-11	s METAL, CHIP 1.8K 5% 1/16W
R133	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R134	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R135	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R136	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R137	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R138	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R139	1-216-848-11	s METAL, CHIP 180K 5% 1/16W
R140	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R141	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R142	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R143	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R144	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R145	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R146	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R147	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R148	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R149	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R150	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R152	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R153	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R201	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R202	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R203	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R205	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R206	1-216-840-11	s METAL, CHIP 39K 5% 1/16W
R207	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R208	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R209	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R210	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R211	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R212	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R213	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R214	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R215	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R216	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R217	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R221	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R222	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R223	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R224	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R226	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R227	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R228	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R229	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R231	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R232	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R233	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R237	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R238	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R239	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R240	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R241	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R242	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R243	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R244	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R245	1-216-848-11	s METAL, CHIP 180K 5% 1/16W
R246	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R247	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R248	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R249	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R250	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R251	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R252	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R253	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R254	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R255	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R256	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R257	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R259	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R301	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R302	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R303	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R304	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R305	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R306	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R308	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R309	1-216-840-11	s METAL, CHIP 39K 5% 1/16W
R310	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R311	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R312	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R313	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R314	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R315	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R316	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R317	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R318	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R319	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R320	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R324	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R325	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R326	1-216-809-11	s METAL, CHIP 100 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R327	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R328	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R329	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R330	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R331	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R332	1-216-824-11	s METAL, CHIP 1.8K 5% 1/16W
R337	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R338	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R339	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R340	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R341	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R342	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R343	1-216-848-11	s METAL, CHIP 180K 5% 1/16W
R344	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R345	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R346	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R347	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R348	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R349	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R350	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R351	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R352	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R353	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R354	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R355	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R357	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R401	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R403	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R404	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R405	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R406	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R407	1-218-702-11	s METAL, CHIP 2.7K 0.50% 1/16W
R408	1-218-703-11	s METAL, CHIP 3K 0.50% 1/16W
R409	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R410	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R411	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R420	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R421	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R422	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R423	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R424	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R425	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R426	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R427	1-218-712-11	s METAL, CHIP 6.8K 0.50% 1/16W
R428	1-218-700-11	s METAL, CHIP 2.2K 0.50% 1/16W
R429	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R430	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R431	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R432	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R433	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R443	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R444	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R445	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R448	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R449	1-218-680-11	s METAL, CHIP 330 0.50% 1/16W
R450	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R451	1-218-680-11	s METAL, CHIP 330 0.50% 1/16W
R452	1-218-696-11	s METAL, CHIP 1.5K 0.50% 1/16W
R453	1-218-699-11	s METAL, CHIP 2K 0.50% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R454	1-218-684-11	s METAL, CHIP 470 0.50% 1/16W
R455	1-218-660-91	s METAL, CHIP 47 0.50% 1/16W
R456	1-218-691-11	s METAL, CHIP 910 0.50% 1/16W
R457	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R458	1-218-658-11	s METAL, CHIP 39 0.50% 1/16W
R460	1-218-689-11	s METAL, CHIP 750 0.50% 1/16W
R461	1-218-656-11	s METAL, CHIP 33 0.50% 1/16W
R462	1-218-735-11	s METAL, CHIP 62K 0.50% 1/16W
R463	1-218-644-11	s METAL, CHIP 10 0.50% 1/16W
R464	1-218-728-11	s METAL, CHIP 33K 0.50% 1/16W
R465	1-218-689-11	s METAL, CHIP 750 0.50% 1/16W
R466	1-218-710-11	s METAL, CHIP 5.6K 0.50% 1/16W
R467	1-218-693-11	s METAL, CHIP 1.1K 0.50% 1/16W
R468	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R469	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R470	1-218-706-11	s METAL, CHIP 3.9K 0.50% 1/16W
R471	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R472	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R473	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R474	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R475	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R476	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R477	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R478	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R483	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R484	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R486	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R489	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R490	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R491	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R492	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R493	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R494	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R495	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R496	1-218-696-11	s METAL, CHIP 1.5K 0.50% 1/16W
R497	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R502	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R503	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R504	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R505	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R506	1-218-702-11	s METAL, CHIP 2.7K 0.50% 1/16W
R507	1-218-703-11	s METAL, CHIP 3K 0.50% 1/16W
R508	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R509	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R510	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R520	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R521	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R522	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R523	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R524	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R525	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R526	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R527	1-218-712-11	s METAL, CHIP 6.8K 0.50% 1/16W
R528	1-218-700-11	s METAL, CHIP 2.2K 0.50% 1/16W
R529	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R530	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R531	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R532	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R533	1-216-797-11	s METAL, CHIP 10 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R538	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R539	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R540	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R543	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R544	1-218-680-11	s METAL, CHIP 330 0.50% 1/16W
R545	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R546	1-218-680-11	s METAL, CHIP 330 0.50% 1/16W
R547	1-218-696-11	s METAL, CHIP 1.5K 0.50% 1/16W
R548	1-218-699-11	s METAL, CHIP 2K 0.50% 1/16W
R549	1-218-684-11	s METAL, CHIP 470 0.50% 1/16W
R550	1-218-660-91	s METAL, CHIP 47 0.50% 1/16W
R551	1-218-691-11	s METAL, CHIP 910 0.50% 1/16W
R552	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R553	1-218-658-11	s METAL, CHIP 39 0.50% 1/16W
R555	1-218-689-11	s METAL, CHIP 750 0.50% 1/16W
R556	1-218-656-11	s METAL, CHIP 33 0.50% 1/16W
R557	1-218-735-11	s METAL, CHIP 62K 0.50% 1/16W
R558	1-218-644-11	s METAL, CHIP 10 0.50% 1/16W
R559	1-218-728-11	s METAL, CHIP 33K 0.50% 1/16W
R560	1-218-689-11	s METAL, CHIP 750 0.50% 1/16W
R561	1-218-710-11	s METAL, CHIP 5.6K 0.50% 1/16W
R562	1-218-693-11	s METAL, CHIP 1.1K 0.50% 1/16W
R563	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R564	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R565	1-218-728-11	s METAL, CHIP 33K 0.50% 1/16W
R566	1-218-726-11	s METAL, CHIP 27K 0.50% 1/16W
R567	1-218-706-11	s METAL, CHIP 3.9K 0.50% 1/16W
R568	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R569	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R570	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R571	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R572	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R573	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R574	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R579	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R580	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R581	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R582	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R583	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R584	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R585	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R586	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R587	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R595	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R596	1-218-696-11	s METAL, CHIP 1.5K 0.50% 1/16W
R597	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R602	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R603	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R604	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R605	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R606	1-218-702-11	s METAL, CHIP 2.7K 0.50% 1/16W
R607	1-218-703-11	s METAL, CHIP 3K 0.50% 1/16W
R608	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R609	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R610	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R620	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R621	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R622	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R623	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R624	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R625	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R626	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R627	1-218-712-11	s METAL 6.8K 0.50% 1/16W
R628	1-218-700-11	s METAL 2.2K 0.50% 1/16W
R629	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R630	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R631	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R632	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R633	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R641	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R642	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R643	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R646	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R647	1-218-680-11	s METAL 330 0.50% 1/16W
R648	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R649	1-218-680-11	s METAL 330 0.50% 1/16W
R650	1-218-696-11	s METAL 1.5K 0.50% 1/16W
R651	1-218-699-11	s METAL, CHIP 2K 0.50% 1/16W
R652	1-218-684-11	s METAL, CHIP 470 0.50% 1/16W
R653	1-218-660-91	s METAL 47 0.50% 1/16W
R654	1-218-691-11	s METAL 910 0.50% 1/16W
R655	1-218-692-11	s METAL, CHIP 1K 0.50% 1/16W
R656	1-218-658-11	s METAL 39 0.50% 1/16W
R658	1-218-689-11	s METAL 750 0.50% 1/16W
R659	1-218-656-11	s METAL 33 0.50% 1/16W
R660	1-218-735-11	s METAL 62K 0.50% 1/16W
R661	1-218-644-11	s METAL 10 0.50% 1/16W
R662	1-218-728-11	s METAL 33K 0.50% 1/16W
R663	1-218-689-11	s METAL 750 0.50% 1/16W
R664	1-218-710-11	s METAL, CHIP 5.6K 0.50% 1/16W
R665	1-218-693-11	s METAL 1.1K 0.50% 1/16W
R666	1-218-698-11	s METAL 1.8K 0.50% 1/16W
R667	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R668	1-218-706-11	s METAL 3.9K 0.50% 1/16W
R669	1-218-716-11	s METAL 10K 0.50% 1/16W
R670	1-218-716-11	s METAL 10K 0.50% 1/16W
R671	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R672	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R673	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R674	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R675	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R676	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R681	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R682	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R683	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R684	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R685	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R686	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R687	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R688	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R689	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R695	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R696	1-218-696-11	s METAL 1.5K 0.50% 1/16W
R697	1-218-698-11	s METAL 1.8K 0.50% 1/16W
RV103	1-238-855-11	s RES, ADJ, METAL 4.7K
RV202	1-238-855-11	s RES, ADJ, METAL 4.7K
RV302	1-238-855-11	s RES, ADJ, METAL 4.7K
RV401	1-238-852-11	s RES, ADJ, CERMET 470

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Ref. No. or Q'ty	Part No.	SP Description
RV404	1-238-853-11	s RES, ADJ, METAL 1K
RV405	1-238-855-11	s RES, ADJ, METAL 4.7K
RV406	1-238-858-11	s RES, ADJ, METAL 47K
RV407	1-238-854-11	s RES, ADJ, METAL 2.2K
RV408	1-238-854-11	s RES, ADJ, METAL 2.2K
RV501	1-238-852-11	s RES, ADJ, CERMET 470
RV504	1-238-853-11	s RES, ADJ, METAL 1K
RV505	1-238-855-11	s RES, ADJ, METAL 4.7K
RV506	1-238-858-11	s RES, ADJ, METAL 47K
RV507	1-238-854-11	s RES, ADJ, METAL 2.2K
RV508	1-238-854-11	s RES, ADJ, METAL 2.2K
RV601	1-238-852-11	s RES, ADJ, CERMET 470
RV604	1-238-853-11	s RES, ADJ, METAL 1K
RV605	1-238-855-11	s RES, ADJ, METAL 4.7K
RV606	1-238-858-11	s RES, ADJ, METAL 47K
RV607	1-238-854-11	s RES, ADJ, METAL 2.2K
RV608	1-238-854-11	s RES, ADJ, METAL 2.2K

RM-171 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8313-470-A	o MOUNTED CIRCUIT BOARD, RM-171
C1	1-164-232-11	s CERAMIC, CHIP 0.01uF 10% 50V
C2	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
CN1	1-764-007-11	s CONNECTOR (SMD) 12P MALE
R1	1-216-652-11	s METAL, CHIP 1.1K 0.5% 1/10W
R2	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R3	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R4	1-216-660-11	s METAL, CHIP 2.4K 0.5% 1/10W
R5	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R6	1-216-668-11	s METAL, CHIP 5.1K 0.5% 1/10W
R7	1-216-652-11	s METAL, CHIP 1.1K 0.5% 1/10W
R8	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R9	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R10	1-216-660-11	s METAL, CHIP 2.4K 0.5% 1/10W
R11	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R12	1-216-668-11	s METAL, CHIP 5.1K 0.5% 1/10W
R13	1-216-652-11	s METAL, CHIP 1.1K 0.5% 1/10W
R14	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R15	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R16	1-216-660-11	s METAL, CHIP 2.4K 0.5% 1/10W
R17	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R18	1-216-668-11	s METAL, CHIP 5.1K 0.5% 1/10W
R19	1-216-652-11	s METAL, CHIP 1.1K 0.5% 1/10W
R22	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R23	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R24	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R25	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W
R26	1-216-655-11	s METAL, CHIP 1.5K 0.5% 1/10W
R27	1-216-657-11	s METAL, CHIP 1.8K 0.5% 1/10W
R28	1-216-660-11	s METAL, CHIP 2.4K 0.5% 1/10W
S1	1-692-829-11	s SWITCH, TACTILE
S2	1-692-829-11	s SWITCH, TACTILE
S3	1-692-829-11	s SWITCH, TACTILE
S4	1-692-829-11	s SWITCH, TACTILE
S5	1-692-829-11	s SWITCH, TACTILE
S6	1-692-829-11	s SWITCH, TACTILE
S8	1-692-829-11	s SWITCH, TACTILE
S9	1-692-829-11	s SWITCH, TACTILE
S10	1-692-829-11	s SWITCH, TACTILE
S11	1-692-829-11	s SWITCH, TACTILE
S12	1-692-829-11	s SWITCH, TACTILE
S13	1-692-829-11	s SWITCH, TACTILE
S15	1-692-829-11	s SWITCH, TACTILE
S16	1-692-829-11	s SWITCH, TACTILE
S17	1-692-829-11	s SWITCH, TACTILE
S18	1-692-829-11	s SWITCH, TACTILE
S19	1-692-829-11	s SWITCH, TACTILE
S20	1-692-829-11	s SWITCH, TACTILE
S22	1-692-829-11	s SWITCH, TACTILE
S23	1-692-829-11	s SWITCH, TACTILE
S24	1-692-829-11	s SWITCH, TACTILE
S25	1-692-829-11	s SWITCH, TACTILE

SY-243 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8313-461-A	o MOUNTED CIRCUIT BOARD, SY-243
2pcs	2-182-909-01	o LEVER, PC BOARD
2pcs	7-626-320-11	s PIN, SPRING 3X8
BH1	1-550-104-41	s HOLDER, BATTERY
BZ1	1-529-029-11	s SPEAKER
C1	1-163-038-91	s CERAMIC 0.1uF 25V
C2	1-163-038-91	s CERAMIC 0.1uF 25V
C3	1-163-038-91	s CERAMIC 0.1uF 25V
C4	1-163-038-91	s CERAMIC 0.1uF 25V
C5	1-163-038-91	s CERAMIC 0.1uF 25V
C6	1-124-778-00	s ELECT 22uF 20% 6.3V
C7	1-163-038-91	s CERAMIC 0.1uF 25V
C8	1-163-038-91	s CERAMIC 0.1uF 25V
C9	1-126-193-11	s ELECT 1uF 20% 50V
C10	1-163-007-11	s CERAMIC 680PF 10% 50V
C11	1-163-038-91	s CERAMIC 0.1uF 25V
C12	1-124-778-00	s ELECT 22uF 20% 6.3V
C13	1-163-038-91	s CERAMIC 0.1uF 25V
C14	1-126-206-11	s ELECT 100uF 20% 6.3V
C15	1-126-206-11	s ELECT 100uF 20% 6.3V
C16	1-163-038-91	s CERAMIC 0.1uF 25V
C17	1-163-038-91	s CERAMIC 0.1uF 25V
C18	1-163-229-11	s CERAMIC 12PF 5% 50V
C19	1-163-099-00	s CERAMIC, CHIP 18PF 5% 50V
C20	1-124-779-00	s ELECT 10uF 20% 16V
C21	1-163-038-91	s CERAMIC 0.1uF 25V
C22	1-163-038-91	s CERAMIC 0.1uF 25V
C23	1-163-038-91	s CERAMIC 0.1uF 25V
C24	1-163-038-91	s CERAMIC 0.1uF 25V
C25	1-163-038-91	s CERAMIC 0.1uF 25V
C26	1-163-038-91	s CERAMIC 0.1uF 25V
C27	1-163-038-91	s CERAMIC 0.1uF 25V
C28	1-163-038-91	s CERAMIC 0.1uF 25V
C29	1-163-038-91	s CERAMIC 0.1uF 25V
C30	1-163-038-91	s CERAMIC 0.1uF 25V
C31	1-124-779-00	s ELECT 10uF 20% 16V
C32	1-124-779-00	s ELECT 10uF 20% 16V
C33	1-124-779-00	s ELECT 10uF 20% 16V
C34	1-163-038-91	s CERAMIC 0.1uF 25V
C35	1-163-038-91	s CERAMIC 0.1uF 25V
C36	1-163-038-91	s CERAMIC 0.1uF 25V
C37	1-163-038-91	s CERAMIC 0.1uF 25V
C38	1-163-038-91	s CERAMIC 0.1uF 25V
C39	1-163-038-91	s CERAMIC 0.1uF 25V
C40	1-163-038-91	s CERAMIC 0.1uF 25V
C41	1-163-038-91	s CERAMIC 0.1uF 25V
C42	1-163-038-91	s CERAMIC 0.1uF 25V
C43	1-126-193-11	s ELECT 1uF 20% 50V
C44	1-163-038-91	s CERAMIC 0.1uF 25V
C45	1-163-038-91	s CERAMIC 0.1uF 25V
C46	1-163-038-91	s CERAMIC 0.1uF 25V
C47	1-163-038-91	s CERAMIC 0.1uF 25V
C48	1-163-038-91	s CERAMIC 0.1uF 25V
C49	1-163-038-91	s CERAMIC 0.1uF 25V
C50	1-163-038-91	s CERAMIC 0.1uF 25V
C51	1-163-038-91	s CERAMIC 0.1uF 25V
C52	1-163-038-91	s CERAMIC 0.1uF 25V

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Ref. No. or Q'ty	Part No.	SP Description
C566	1-163-038-91 s	CERAMIC 0.1uF 25V
C567	1-163-038-91 s	CERAMIC 0.1uF 25V
C568	1-163-038-91 s	CERAMIC 0.1uF 25V
C569	1-163-038-91 s	CERAMIC 0.1uF 25V
C570	1-163-038-91 s	CERAMIC 0.1uF 25V
C571	1-163-038-91 s	CERAMIC 0.1uF 25V
C572	1-163-038-91 s	CERAMIC 0.1uF 25V
C573	1-163-038-91 s	CERAMIC 0.1uF 25V
C574	1-163-038-91 s	CERAMIC 0.1uF 25V
C575	1-163-038-91 s	CERAMIC 0.1uF 25V
C576	1-163-038-91 s	CERAMIC 0.1uF 25V
C577	1-163-038-91 s	CERAMIC 0.1uF 25V
C578	1-163-038-91 s	CERAMIC 0.1uF 25V
C579	1-163-038-91 s	CERAMIC 0.1uF 25V
C580	1-163-038-91 s	CERAMIC 0.1uF 25V
C581	1-163-038-91 s	CERAMIC 0.1uF 25V
C582	1-163-038-91 s	CERAMIC 0.1uF 25V
C583	1-163-038-91 s	CERAMIC 0.1uF 25V
C584	1-163-038-91 s	CERAMIC 0.1uF 25V
C585	1-163-038-91 s	CERAMIC 0.1uF 25V
C586	1-163-038-91 s	CERAMIC 0.1uF 25V
C587	1-126-205-11 s	ELECT 47uF 20% 6.3V
C588	1-126-205-11 s	ELECT 47uF 20% 6.3V
C589	1-163-038-91 s	CERAMIC 0.1uF 25V
C590	1-163-038-91 s	CERAMIC 0.1uF 25V
C591	1-163-038-91 s	CERAMIC 0.1uF 25V
C592	1-163-038-91 s	CERAMIC 0.1uF 25V
C593	1-163-038-91 s	CERAMIC 0.1uF 25V
C594	1-163-038-91 s	CERAMIC 0.1uF 25V
C600	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C601	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C602	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C603	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C604	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C605	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C606	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C607	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C608	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C609	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C610	1-163-127-00 s	CERAMIC, CHIP 270PF 5% 50V
C611	1-163-038-91 s	CERAMIC 0.1uF 25V
CN1	1-778-261-11 o	CONNECTOR, BOARD TO BOARD 124P
CNI1	1-526-660-21 o	SOCKET, IC 32P
CNI2	1-526-660-21 o	SOCKET, IC 32P
D2	8-719-800-76 s	DIODE 1SS226
D3	8-719-404-20 s	DIODE LN1251C-TR
D4	8-719-404-20 s	DIODE LN1251C-TR
D5	8-719-404-20 s	DIODE LN1251C-TR
D6	8-719-404-20 s	DIODE LN1251C-TR
D7	8-719-404-20 s	DIODE LN1251C-TR
D8	8-719-404-20 s	DIODE LN1251C-TR
D9	8-719-404-20 s	DIODE LN1251C-TR
D10	8-719-404-20 s	DIODE LN1251C-TR
D11	8-719-800-76 s	DIODE 1SS226
D12	8-719-800-76 s	DIODE 1SS226
D500	8-719-801-95 s	DIODE 2GWJ42

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Ref. No. or Q'ty	Part No.	SP Description
F1	1-532-743-11 s	FUSE, GLASS TUBE 2A 125V
FH1	1-533-189-11 s	HOLDER, FUSE
FH2	1-533-189-11 s	HOLDER, FUSE
FL1	1-239-400-11 s	FILTER, CHIP EMI
FL2	1-421-773-11 s	FILTER, NOISE REMOVAL
FL3	1-239-400-11 s	FILTER, CHIP EMI
FL4	1-239-558-11 s	FILTER, CHIP EMI
FL5	1-239-558-11 s	FILTER, CHIP EMI
FL6	1-239-558-11 s	FILTER, CHIP EMI
FL7	1-239-558-11 s	FILTER, CHIP EMI
IC1	8-759-185-69 s	IC TC74VHC27F(EL)
IC2	8-759-186-38 s	IC TC74VHC32F
IC3	8-759-186-38 s	IC TC74VHC32F
IC4	8-759-081-44 s	IC TC74VHC04F
IC5	8-759-081-44 s	IC TC74VHC04F
IC6	8-759-185-67 s	IC TC74VHC20F(EL)
IC7	8-759-186-38 s	IC TC74VHC32F
IC8	8-759-081-48 s	IC TC74VHC08F
IC9	8-759-081-48 s	IC TC74VHC08F
IC10	8-759-925-72 s	IC SN74HC02ANS
IC11	8-759-925-90 s	IC SN74HC74ANS
IC12	8-759-186-39 s	IC TC74VHC74F
IC13	8-759-174-16 s	IC TC74VHC244F
IC14	8-759-926-48 s	IC SN74HC244ANS
IC15	8-759-925-80 s	IC SN74HC14ANS
IC16	8-759-973-71 s	IC TL7705CPS-B
IC17	8-759-054-56 s	IC SN75179BPS
IC18	8-759-925-76 s	IC SN74HC08NS
IC19	8-759-426-14 s	IC UPD70741GC-25-7EA
IC20	8-759-186-53 s	IC TC74VHC163F
IC21	8-759-038-28 s	IC MC145407F
IC22	8-759-055-21 s	IC HN58C66SFP25TZ
IC23	8-759-055-21 s	IC HN58C66SFP25TZ
IC25	8-759-190-79 s	IC UPD72001GC-11-3B6
IC26	8-759-174-16 s	IC TC74VHC244F
IC27	8-759-371-04 s	IC HM514260CJ7-Z
IC28	8-759-926-56 s	IC SN74HC273ANS
IC29	8-759-065-20 s	IC RTC-4553B
IC30	8-759-926-56 s	IC SN74HC273ANS
IC31	8-752-378-41 s	IC CXD207-109Q
IC32	8-752-364-81 s	IC CXK581000AM-70LL
IC33	8-759-186-02 s	IC TC74VHC245F(EL)
IC34	8-759-926-48 s	IC SN74HC244ANS
IC35	8-759-926-48 s	IC SN74HC244ANS
IC36	8-759-926-48 s	IC SN74HC244ANS
IC37	8-759-926-56 s	IC SN74HC273ANS
IC38	8-759-926-56 s	IC SN74HC273ANS
IC39	8-759-473-39 o	IC 27C1001-10F1-ST5LV1.00
IC40	8-759-473-40 o	IC 27C1001-10F1-ST5UV1.00
IC100	8-759-287-50 s	IC CXD8932Q
IC101	8-759-297-58 s	IC DS1000Z-75
IC102	8-759-297-60 s	IC DS1000Z-75
IC103	8-759-297-58 s	IC DS1000Z-75
IC104	8-759-987-27 s	IC LM1881M
IC105	8-759-186-39 s	IC TC74VHC74F
IC106	8-759-081-44 s	IC TC74VHC04F
IC107	8-759-081-44 s	IC TC74VHC04F

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Ref. No. or Q'ty	Part No.	SP Description
IC108	8-759-186-26	s IC TC74VHC02F
IC109	8-759-186-39	s IC TC74VHC74F
IC110	8-759-174-16	s IC TC74VHC244F
IC111	8-759-925-80	s IC SN74HC14ANS
IC112	8-759-186-39	s IC TC74VHC74F
IC113	8-759-186-38	s IC TC74VHC32F
IC114	8-759-186-44	s IC TC74VHC125F
IC115	8-759-081-42	s IC TC74VHC00F
IC116	8-759-186-39	s IC TC74VHC74F
IC117	8-759-926-24	s IC SN74HC164ANS
IC118	8-759-186-44	s IC TC74VHC125F
IC500	8-759-461-89	o IC UPD65810GD-047-LML
IC501	8-752-362-81	s IC CXD210-108Q
IC502	8-752-362-83	s IC CXD209-107Q
IC503	8-759-461-90	o IC UPD65808GN-056-LMU
IC504	8-759-384-47	s IC SYM53CF92A-64QFP
IC505	8-759-388-42	s IC BH9595FP-Y-E2
IC506	8-759-354-55	s IC HM5117800BJ-7EL
IC507	8-759-354-55	s IC HM5117800BJ-7EL
IC508	8-759-354-55	s IC HM5117800BJ-7EL
IC509	8-759-179-94	s IC HM530281-20
IC510	8-759-179-94	s IC HM530281-20
IC511	8-759-179-94	s IC HM530281-20
IC512	8-759-179-94	s IC HM530281-20
IC513	8-759-179-94	s IC HM530281-20
IC514	8-759-179-94	s IC HM530281-20
IC515	8-759-357-05	s IC HM514800CJ7Z
IC516	8-759-357-05	s IC HM514800CJ7Z
IC517	8-759-357-05	s IC HM514800CJ7Z
IC518	8-759-175-29	s IC TC74VHC374F
IC519	8-759-175-29	s IC TC74VHC374F
IC520	8-759-175-29	s IC TC74VHC374F
IC521	8-759-175-29	s IC TC74VHC374F
IC522	8-759-174-16	s IC TC74VHC244F
IC523	8-759-174-16	s IC TC74VHC244F
IC524	8-759-174-16	s IC TC74VHC244F
IC525	8-759-186-02	s IC TC74VHCT245F(EL)
IC526	8-759-186-02	s IC TC74VHCT245F(EL)
IC527	8-759-186-02	s IC TC74VHCT245F(EL)
IC528	8-759-926-48	s IC SN74HC244ANS
IC529	8-759-926-56	s IC SN74HC273ANS
IC530	8-759-926-56	s IC SN74HC273ANS
IC531	8-759-081-44	s IC TC74VHC04F
IC532	8-759-242-13	s IC TC74HC4072AF
IC534	8-759-186-38	s IC TC74VHC32F
IC535	8-759-186-38	s IC TC74VHC32F
IC536	8-759-186-29	s IC TC74VHC11F
IC537	8-759-174-16	s IC TC74VHC244F
IC538	8-759-174-16	s IC TC74VHC244F
IC539	8-759-174-16	s IC TC74VHC244F
IC540	8-759-174-16	s IC TC74VHC244F
IC541	8-759-031-84	s IC SC7S04F
L1	1-410-373-31	s INDUCTOR CHIP 2.2uH
L2	1-410-373-31	s INDUCTOR CHIP 2.2uH
Q1	8-729-024-91	s TRANSISTOR 2SC2712-GL-TE85L
Q2	8-729-216-22	s TRANSISTOR 2SA1162
Q3	8-729-027-46	s TRANSISTOR DTC114YKA-T146

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Ref. No. or Q'ty	Part No.	SP Description
R1	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R2	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R3	1-216-689-11	s METAL, CHIP 39K 0.5% 1/10W
R4	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R5	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R6	1-216-089-91	s METAL 47K 5% 1/10W
R7	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R8	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R9	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R10	1-216-051-00	s METAL, CHIP 1.2K 5% 1/10W
R11	1-216-017-91	s METAL 47 5% 1/10W
R12	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R13	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R14	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R15	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R16	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R17	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R18	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R19	1-216-689-11	s METAL, CHIP 39K 0.5% 1/10W
R20	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R21	1-216-624-11	s METAL, CHIP 75 0.5% 1/10W
R22	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R23	1-216-089-91	s METAL 47K 5% 1/10W
R25	1-216-295-00	s METAL, CHIP 0 5% 1/10W
R30	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R31	1-216-089-91	s METAL 47K 5% 1/10W
R32	1-216-025-00	s METAL, CHIP 100 5% 1/10W
R33	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R34	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R35	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R36	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R37	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R38	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R39	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R40	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R41	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R42	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R43	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R44	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R45	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R46	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R47	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R48	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R49	1-216-037-00	s METAL, CHIP 330 5% 1/10W
R50	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R51	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R52	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R53	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R54	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R55	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R56	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R57	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R61	1-216-089-91	s METAL 47K 5% 1/10W
R62	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R63	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R64	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R65	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R66	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R67	1-216-073-00	s METAL, CHIP 10K 5% 1/10W

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Ref. No. or Q'ty	Part No.	SP Description
R68	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R69	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R70	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R71	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R72	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R73	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R74	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R75	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R76	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R77	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R78	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R79	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R80	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R81	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R82	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R83	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W
R84	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R85	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R86	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R92	1-216-013-00	s METAL, CHIP 33 5% 1/10W
R93	1-216-049-00	s METAL, CHIP 1K 5% 1/10W
R500	1-216-089-91	s METAL 47K 5% 1/10W
R501	1-216-089-91	s METAL 47K 5% 1/10W
R502	1-216-089-91	s METAL 47K 5% 1/10W
R503	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R504	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W
R505	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R506	1-216-073-00	s METAL, CHIP 10K 5% 1/10W
R510	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R511	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R512	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R513	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R514	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R515	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R516	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R517	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R518	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R519	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R520	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R521	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R522	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R523	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R524	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R525	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R526	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R527	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R528	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R529	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R530	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R531	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R532	1-216-035-00	s METAL, CHIP 270 5% 1/10W
R533	1-216-035-00	s METAL, CHIP 270 5% 1/10W
S1	1-571-187-11	s SWITCH, TACTIL (REFLOW TYPE)
S2	1-571-187-11	s SWITCH, TACTIL (REFLOW TYPE)
S3	1-571-967-11	s SWITCH, DIP (PIANO TYPE)
S4	1-571-120-11	s SWITCH, SLIDE
S500	1-533-817-21	s THERMISTOR
X1	1-567-862-11	s CRYSTAL, 4.9152MHZ

(SY-243 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
X2	1-760-721-11	s CRYSTAL 20MHz

TG-180 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8313-462-A	o MOUNTED CIRCUIT BOARD, TG-180
C1	1-164-156-11	s CERAMIC 0.1uF 25V
C2	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C3	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C4	1-113-987-11	s TANTALUM 4.7uF 20% 25V
C5	1-164-156-11	s CERAMIC 0.1uF 25V
C6	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C7	1-164-156-11	s CERAMIC 0.1uF 25V
C8	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C9	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C10	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C11	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C12	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C13	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C14	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C15	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C16	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C17	1-113-985-11	s TANTALUM 10uF 20% 20V
C18	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C19	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C20	1-164-156-11	s CERAMIC 0.1uF 25V
C21	1-164-156-11	s CERAMIC 0.1uF 25V
C22	1-164-156-11	s CERAMIC 0.1uF 25V
C23	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C24	1-164-156-11	s CERAMIC 0.1uF 25V
C25	1-164-156-11	s CERAMIC 0.1uF 25V
C26	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C27	1-164-156-11	s CERAMIC 0.1uF 25V
C28	1-164-156-11	s CERAMIC 0.1uF 25V
C29	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C30	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C31	1-113-987-11	s TANTALUM 4.7uF 20% 25V
C32	1-164-156-11	s CERAMIC 0.1uF 25V
C33	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C34	1-164-156-11	s CERAMIC 0.1uF 25V
C35	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C36	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C37	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C38	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C39	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C40	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C41	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C42	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C43	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C44	1-113-985-11	s TANTALUM 10uF 20% 20V
C45	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C46	1-164-156-11	s CERAMIC 0.1uF 25V
C47	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C48	1-164-156-11	s CERAMIC 0.1uF 25V
C49	1-135-212-21	s TANTALUM, CHIP 2.2uF 10% 35V
C50	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C51	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C52	1-113-985-11	s TANTALUM 10uF 20% 20V
C53	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C54	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C55	1-113-987-11	s TANTALUM 4.7uF 20% 25V
C56	1-164-156-11	s CERAMIC 0.1uF 25V
C57	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V

(TG-180 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C58	1-164-156-11	s CERAMIC 0.1uF 25V
C59	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C60	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C61	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C62	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C63	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C64	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C65	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C66	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C67	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V
C68	1-113-985-11	s TANTALUM 10uF 20% 20V
C69	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C70	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C71	1-128-397-21	s ELECT 100uF 20% 16V
C72	1-126-399-11	s ELECT, CHIP 10uF 20% 35V
C73	1-126-399-11	s ELECT, CHIP 10uF 20% 35V
C74	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C75	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C76	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C77	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C78	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C101	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C102	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C103	1-104-851-11	s TANTALUM, CHIP 10uF 20% 10V
C104	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C105	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C106	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C107	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C108	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C109	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C110	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C111	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
CN1	1-764-082-21	s PIN, CONNECTOR (PC BOARD) 11P
CN2	1-764-081-21	s PIN, CONNECTOR (PC BOARD) 9P
CN3	1-764-082-21	s PIN, CONNECTOR (PC BOARD) 11P
CN4	1-764-081-21	s PIN, CONNECTOR (PC BOARD) 9P
CN5	1-764-082-21	s PIN, CONNECTOR (PC BOARD) 11P
CN6	1-764-081-21	s PIN, CONNECTOR (PC BOARD) 9P
CN7	1-569-481-21	s CONNECTOR, FPC 30P
CP1	1-767-326-21	s OSCILLATOR, CRYSTAL 40MHZ
D1	8-719-024-81	s DIODE 1SS300-TE85L
D2	8-719-024-81	s DIODE 1SS300-TE85L
D3	8-719-024-81	s DIODE 1SS300-TE85L
D4	8-719-024-81	s DIODE 1SS300-TE85L
IC1	8-759-073-52	s IC TC74AC04F-EL
IC2	8-759-073-52	s IC TC74AC04F-EL
IC3	8-759-073-52	s IC TC74AC04F-EL
IC4	8-759-172-33	s IC UPD16502GS(1)
IC5	8-752-378-12	s IC CXD2437TQ
IC6	8-759-073-52	s IC TC74AC04F-EL
IC7	8-759-073-52	s IC TC74AC04F-EL
IC8	8-759-172-33	s IC UPD16502GS(1)
IC9	8-759-172-33	s IC UPD16502GS(1)
IC10	8-759-073-52	s IC TC74AC04F-EL
IC11	8-759-073-52	s IC TC74AC04F-EL
IC12	8-759-172-33	s IC UPD16502GS(1)
IC13	8-759-242-76	s IC TC7W08F

(TG-180 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
IC101	8-759-190-60	s IC CXD8843R
IC102	8-759-234-20	s IC TC7S08F
IC103	8-759-925-90	s IC SN74HC74ANS
IC104	8-759-927-46	s IC SN74HC00ANS
L1	1-408-789-21	s INDUCTOR CHIP 100uH
L2	1-408-789-21	s INDUCTOR CHIP 100uH
L3	1-408-789-21	s INDUCTOR CHIP 100uH
L4	1-408-789-21	s INDUCTOR CHIP 100uH
Q1	8-729-429-98	s TRANSISTOR XP1401
Q2	8-729-429-44	s TRANSISTOR XP1501-TXE
Q3	8-729-905-35	s TRANSISTOR 2SC4081R
Q4	8-729-429-98	s TRANSISTOR XP1401
Q5	8-729-429-44	s TRANSISTOR XP1501-TXE
Q6	8-729-905-35	s TRANSISTOR 2SC4081R
Q7	8-729-429-98	s TRANSISTOR XP1401
Q8	8-729-429-44	s TRANSISTOR XP1501-TXE
Q9	8-729-905-35	s TRANSISTOR 2SC4081R
Q10	8-729-026-53	s TRANSISTOR 2SA1576A-T106-QR
Q11	8-729-905-35	s TRANSISTOR 2SC4081R
R1	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R2	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R3	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R4	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R5	1-216-846-11	s METAL, CHIP 120K 5% 1/16W
R6	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R7	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R8	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R9	1-216-843-11	s METAL, CHIP 68K 5% 1/16W
R10	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R11	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R12	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R13	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R14	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R15	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R16	1-216-846-11	s METAL, CHIP 120K 5% 1/16W
R17	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R18	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R19	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R20	1-216-843-11	s METAL, CHIP 68K 5% 1/16W
R21	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R22	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R23	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R24	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R25	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R26	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R27	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R28	1-216-846-11	s METAL, CHIP 120K 5% 1/16W
R29	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R30	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R31	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R32	1-216-843-11	s METAL, CHIP 68K 5% 1/16W
R33	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R34	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R35	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R36	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R37	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R38	1-216-820-11	s METAL, CHIP 820 5% 1/16W
R39	1-216-813-11	s METAL, CHIP 220 5% 1/16W

(TG-180 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R40	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R41	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R42	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R43	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R44	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R101	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R102	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R103	1-216-813-11	s METAL, CHIP 220 5% 1/16W
RV1	1-238-856-11	s RES, ADJ, METAL 10K
RV2	1-238-856-11	s RES, ADJ, METAL 10K
RV3	1-238-856-11	s RES, ADJ, METAL 10K
RV4	1-238-857-11	s RES, ADJ, CERMET 22K
RV5	1-238-857-11	s RES, ADJ, CERMET 22K
RV6	1-238-857-11	s RES, ADJ, CERMET 22K

FRAME

Ref. No. or Q'ty	Part No.	SP Description
<CAMERA BLOCK>		
1pc	1-543-590-21	s CORE, TROIDAL
1pc	Δ 1-571-877-11	s SWITCH, PUSH (AC POWER)
1pc	1-782-281-11	s WIRE, FLAT TYPE (30-CORE)
1pc	1-957-462-11	o HARNESS, SUB (MC-1)
1pc	1-957-463-11	s HARNESS, SUB (MC-2)
1pc	1-957-464-11	s HARNESS, SUB (MC-3)
1pc	1-957-465-11	s HARNESS, SUB (MC-4)

CN-1395 BOARD:		
CN207	1-540-256-21	s SOCKET, SYNCHRONIZE "FLASH"
CN204	1-562-382-31	s CONNECTOR, BNC "MONITOR"
CN205	1-561-284-21	s SOCKET, DIN 8P "VF"

CN-1462 BOARD:		
CN302	1-569-422-11	s CONNECTOR, 20P FEMALE "LENS 1"
CN303	1-779-426-11	o CONNECTOR, 12P "REMOTE"

<PROCESSOR BLOCK>		
1pc	Δ 1-251-141-11	s INLET, AC (3P)
1pc	Δ 1-468-173-11	s REGULATOR, SWITCHING
1pc	1-541-981-11	s MOTOR, DC FAN
1pc	1-957-453-11	o HARNESS, SUB (DC1)
1pc	1-957-454-11	s HARNESS, SUB (CAM)

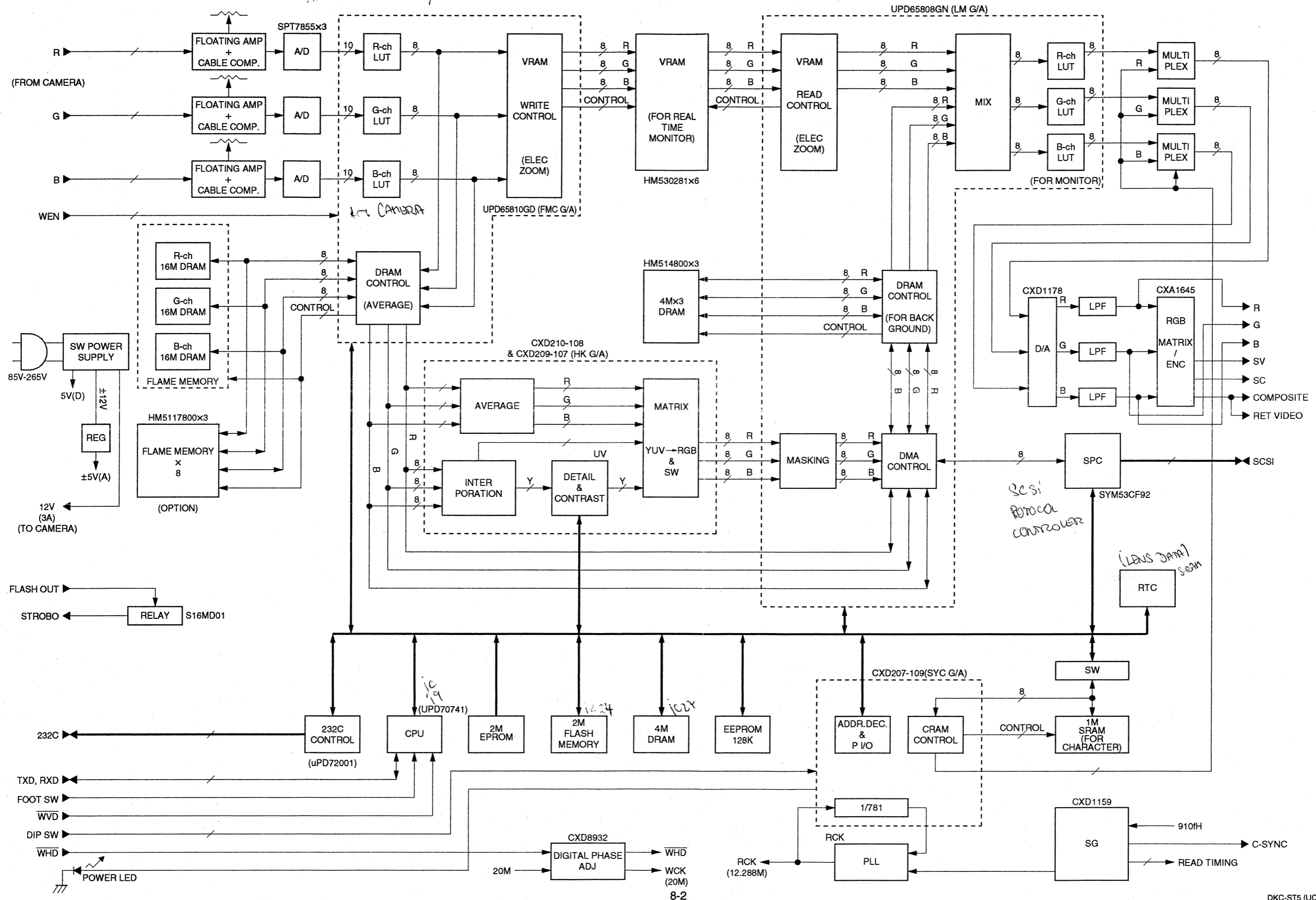
PACKING MATERIALS & SUPPLIED ACCESSORIES

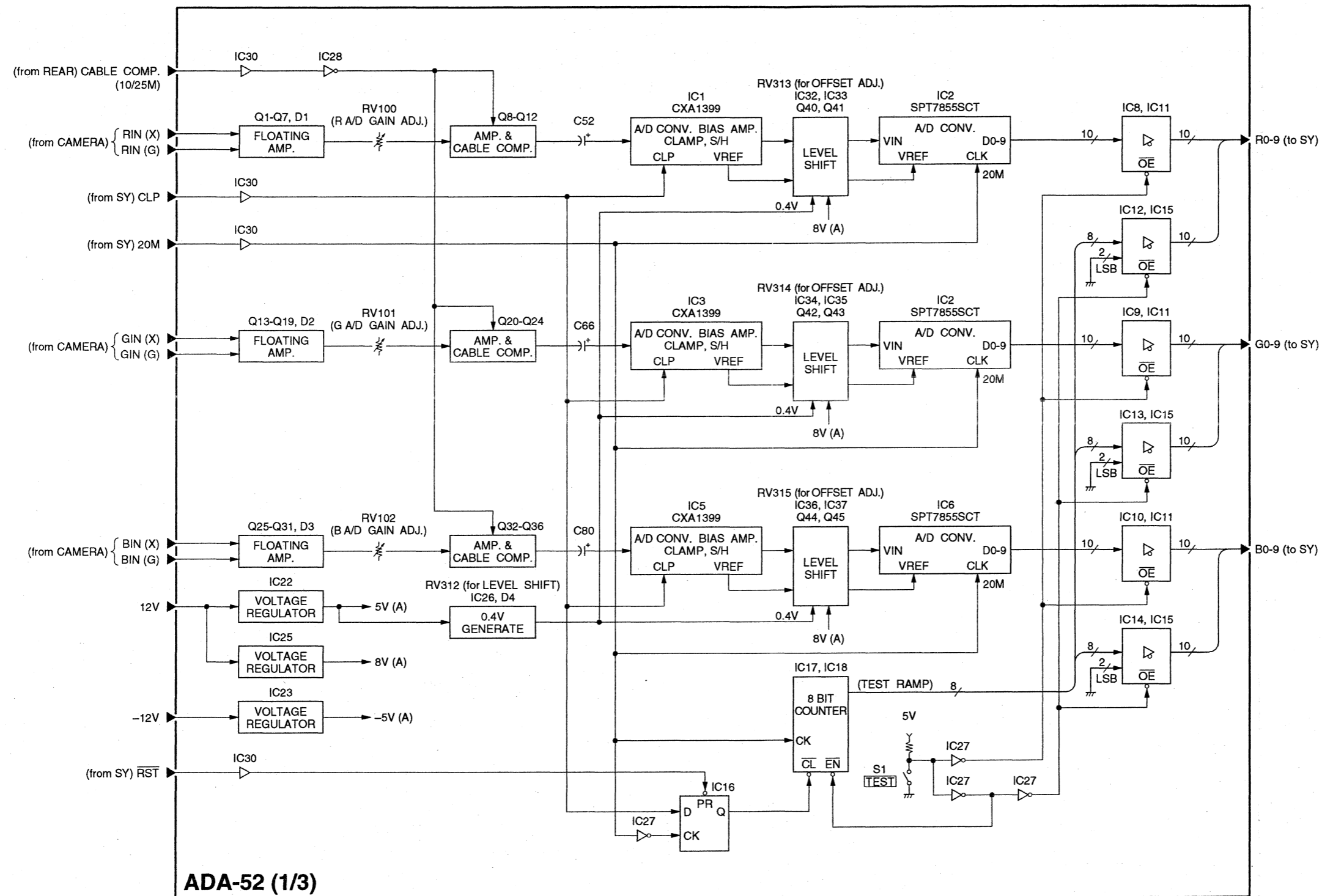
Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8278-559-B	o DISC ASSY(WIN,E)
1pc	A-8278-617-A	o DISC ASSY(MAC,E)
2pcs	1-500-037-11	s CORE, FERRITE (WITH CASE)
1pc	Δ 1-534-827-14	s CORD, POWER
2pcs	1-543-993-11	s CORE, FERRITE
1pc	1-782-622-11	s CABLE, CONNECTION (CCZ-A10)
1pc	3-337-865-11	s SHEET, PROTECTION
1pc	3-859-629-11	s MANUAL (HARD WARE), INSTRUCTION

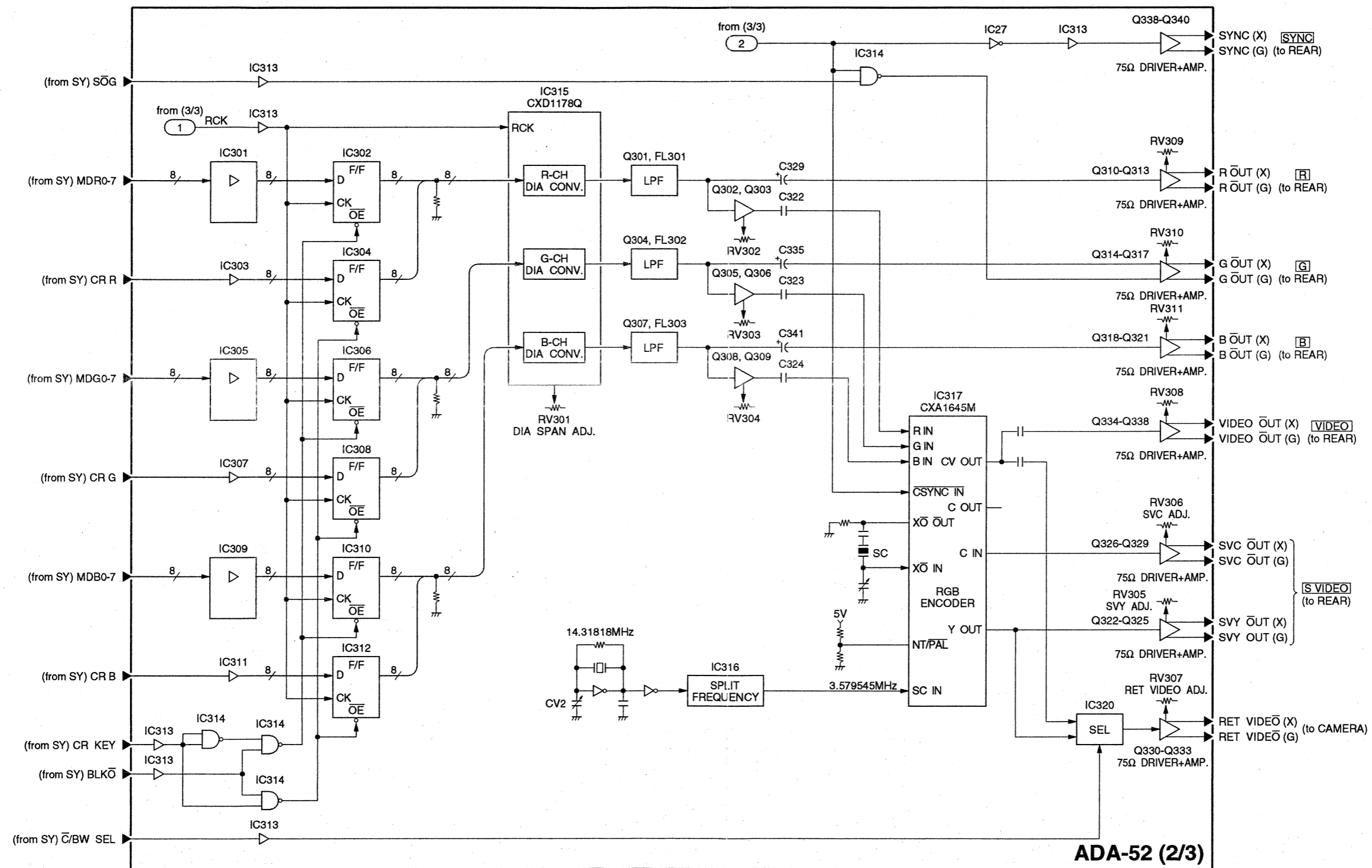
SECTION 8 BLOCK DIAGRAMS

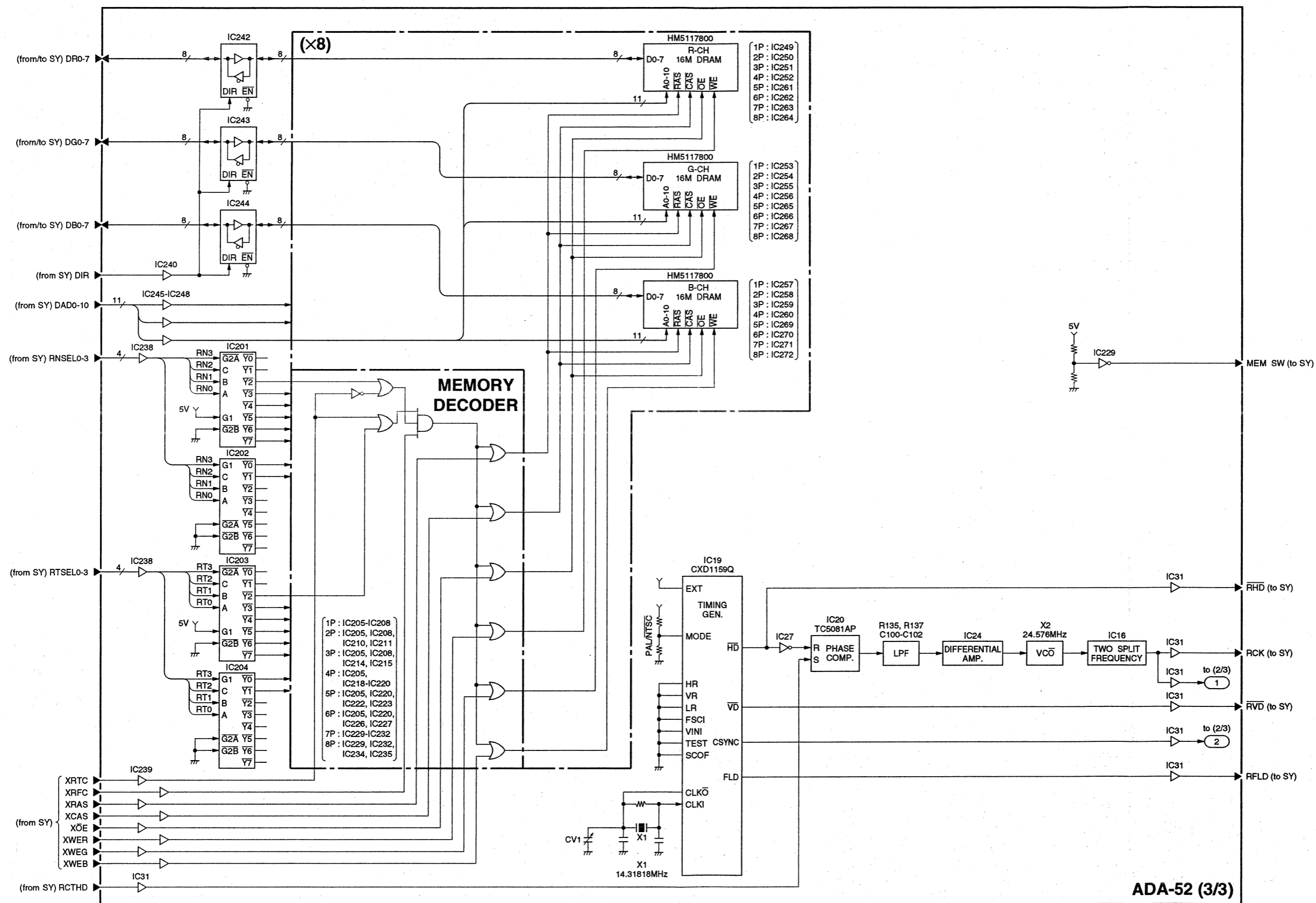
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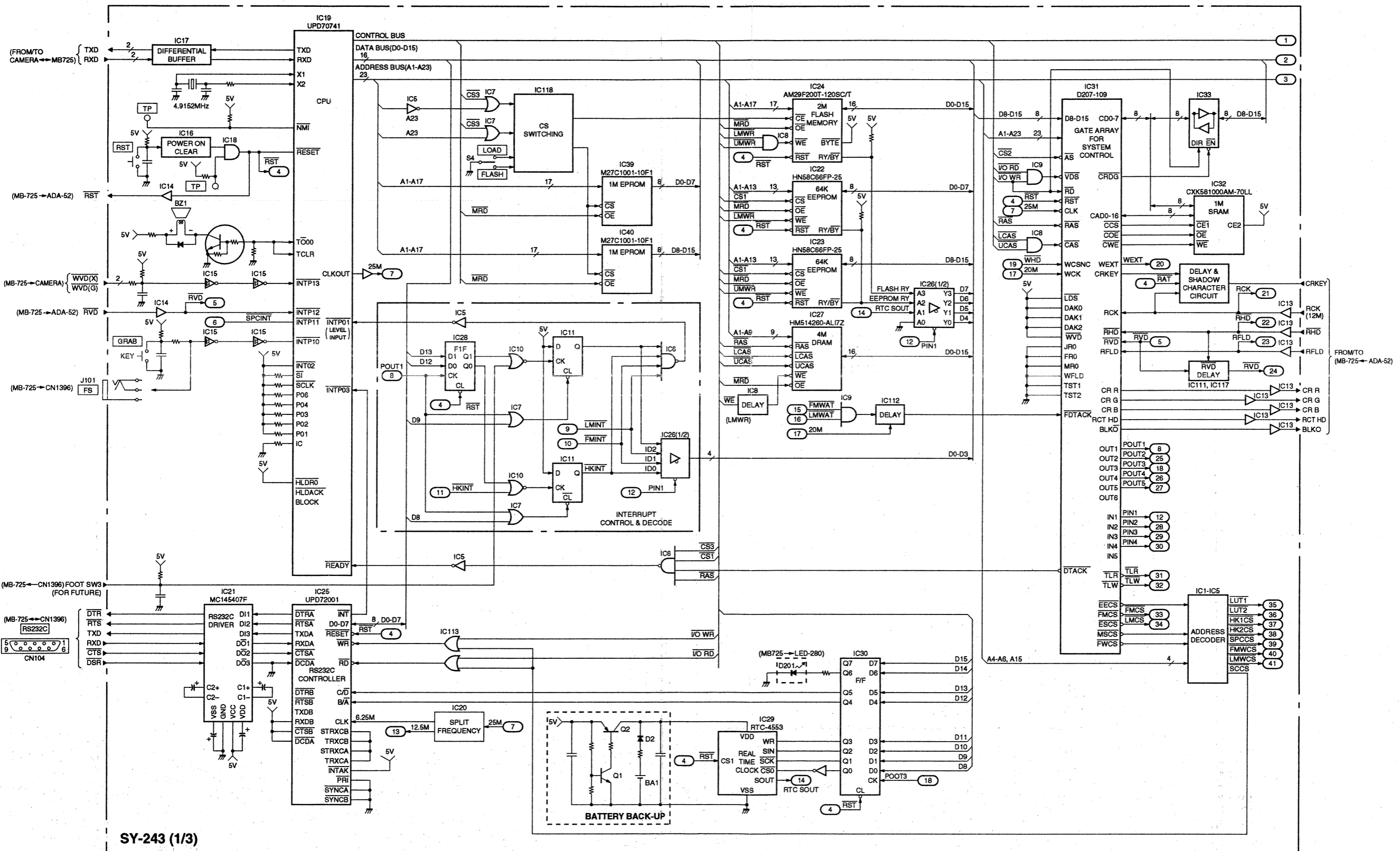
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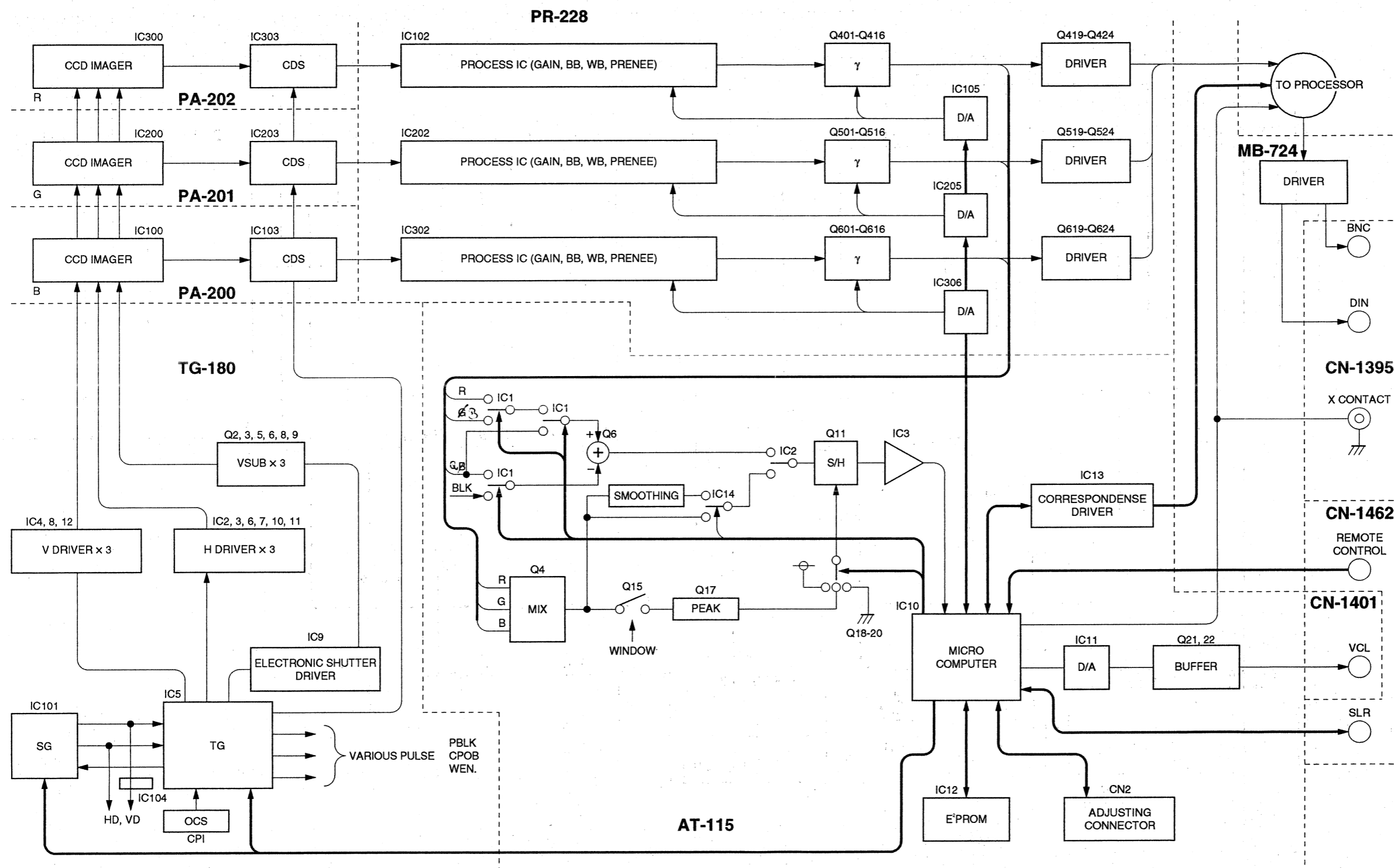




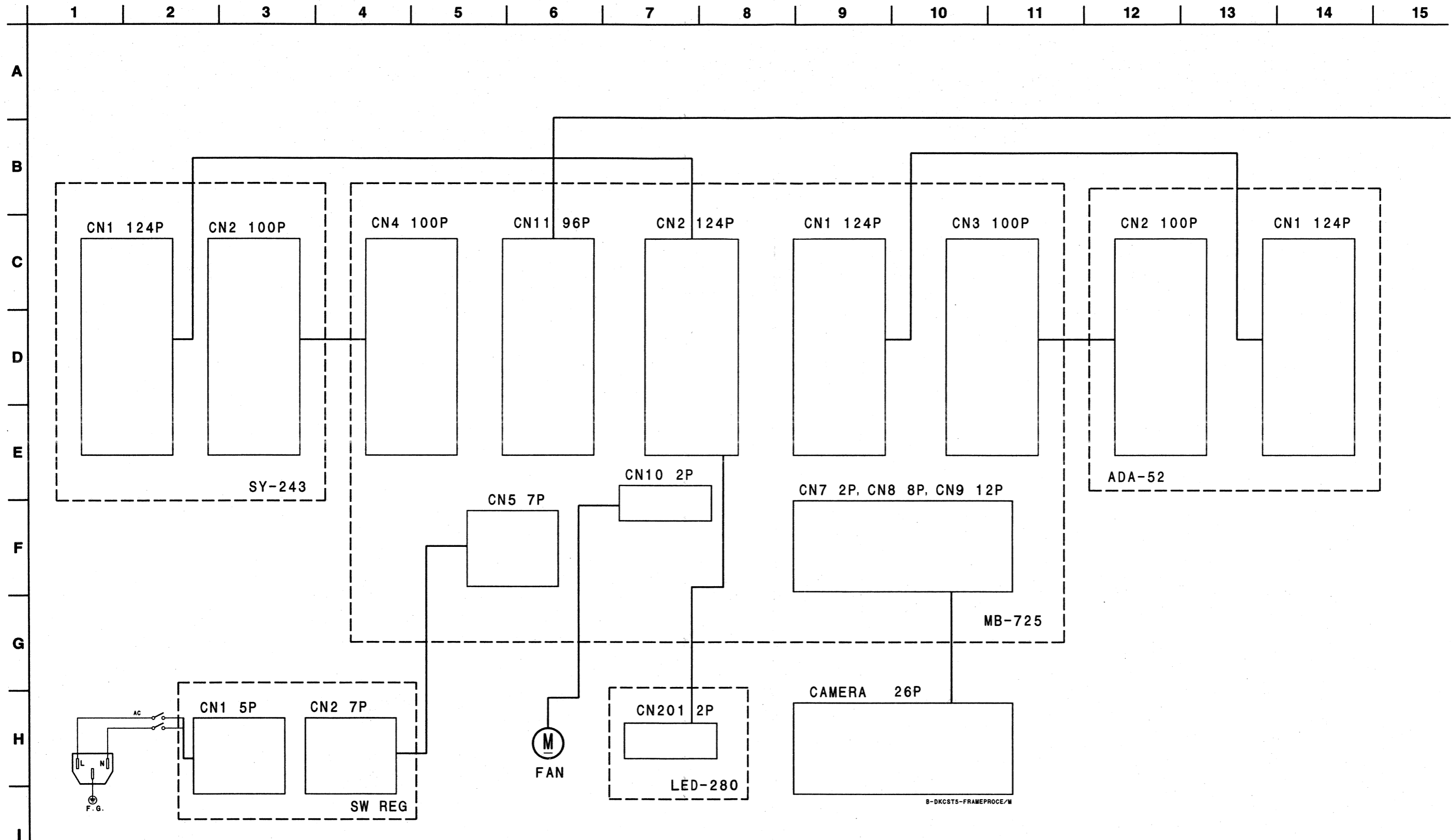


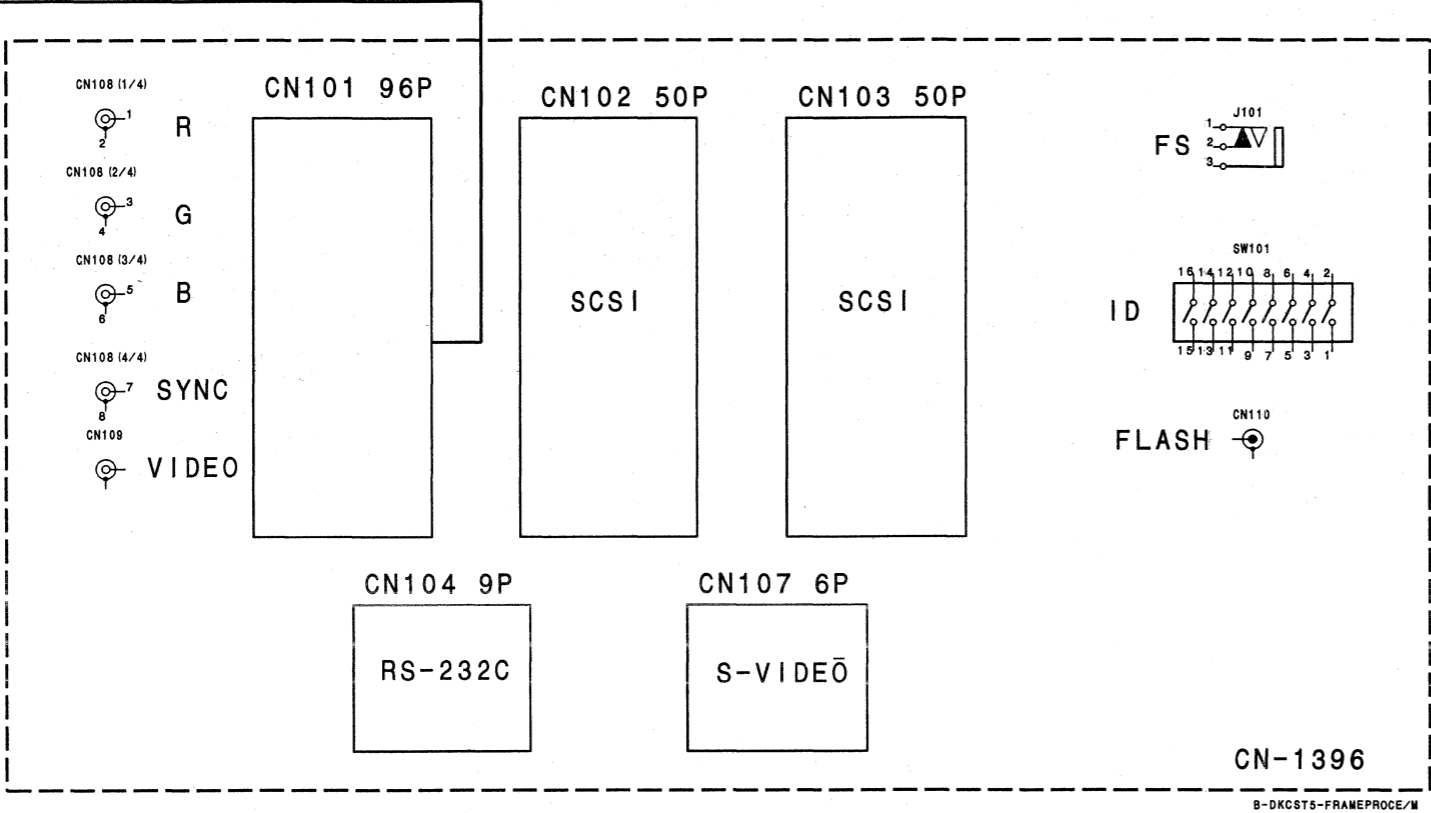









SECTION 9
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS






THIS NOTE IS COMMON FOR PRINTED WIRING
BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed
in each block.)

- **For Schematic Diagrams.**
- Caution when replacing chip parts.
New parts must be attached after removal of chip.
Be careful not to heat the minus side of tantalum
capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted.
k: 1000 , M : 1000k .
- All capacitors are in μ F unless otherwise noted.
pF: μ F.
- 50V or less are not indicated except for electrolytics and
tantalums.
- All variable and adjustable resistors have characteristic
curve B, unless otherwise noted.
-  : nonflammable resistor.
-  : fusible resistor.

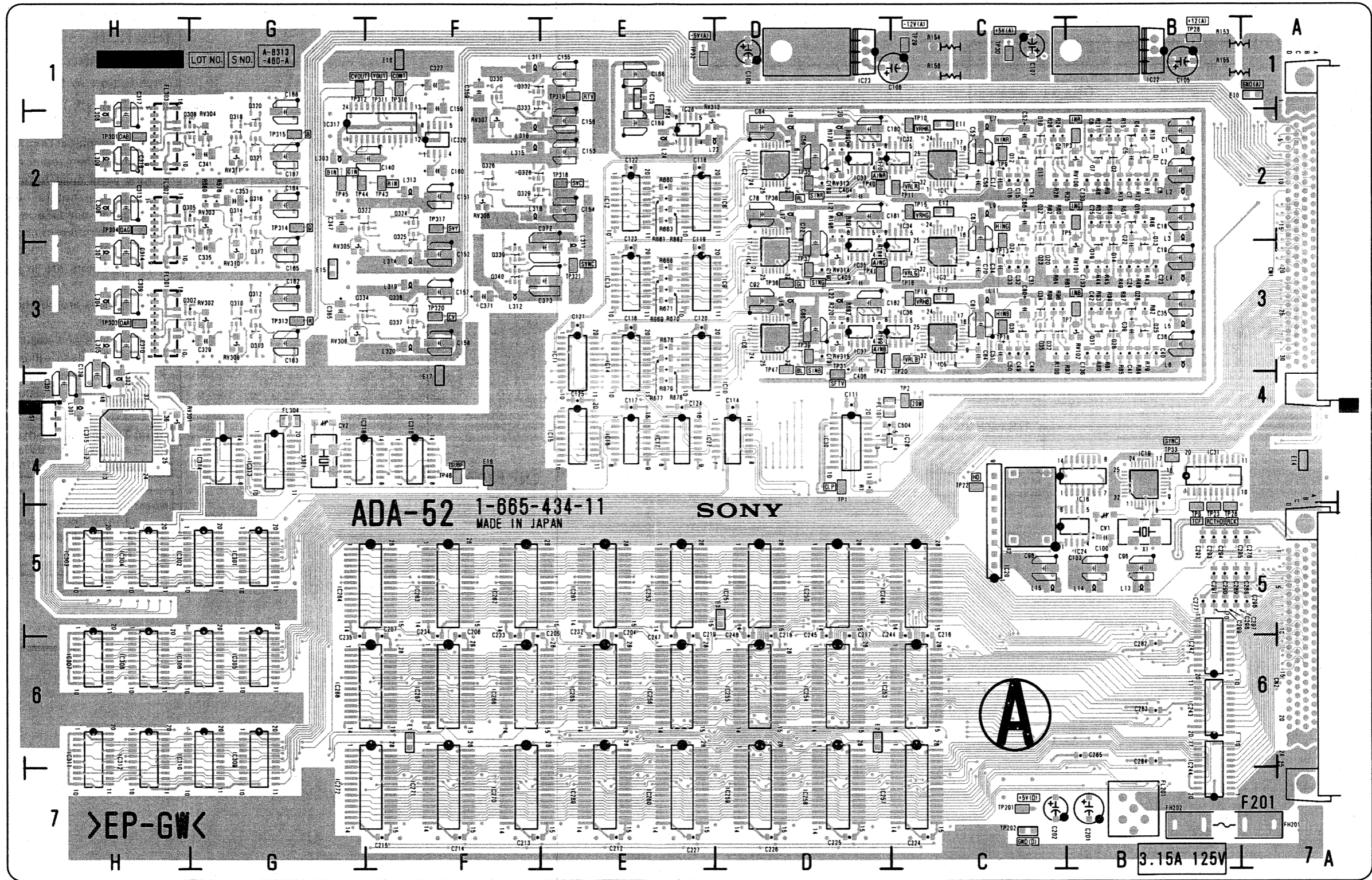
Note: The components identified by mark  are
critical for safety. Replace only with part
number specified.

Note: Les composants identifiés par une marque 
sont d'une importance critique pour la sécurité.
Ne les remplacer que par des pièces de numéro
spécifié.

ADA-52 BOARD(1/2)

CN1	A1	*IC232	F6
CN2	A5	*IC234	F6
CV1	B5	*IC235	F7
CV2	G4	*IC238	B5
*D1	B2	*IC239	B5
*D2	B3	*IC240	C6
*D3	B3	IC242	B6
*D4	E2	IC243	B6
E1	F6	IC244	B7
E2	D6	*IC245	B6
E3	D5	*IC246	B6
E10	A1	*IC247	B6
E11	C2	*IC248	B6
E12	C2	IC249	C5
E13	C3	IC250	D5
E14	A4	IC251	D5
E15	G3	IC252	E5
E16	F1	IC253	C6
E17	F4	IC254	D6
E18	F4	IC255	D6
FH201	A7	IC256	E6
FH202	B7	IC257	C7
FL101	D4	IC258	D7
FL201	B7	IC259	D7
FL301	H3	IC260	E7
FL302	H2	IC261	E5
FL303	H2	IC262	F5
FL304	G4	IC263	F5
F201	A7	IC264	F5
IC1	C2	IC265	E6
IC2	D2	IC266	F6
IC3	C3	IC267	F6
IC4	D3	IC268	F6
IC5	C3	IC269	E7
IC6	D3	IC270	F7
IC8	E2	IC271	F7
IC9	E3	IC272	F7
IC10	E3	IC301	G5
IC11	E3	IC302	G5
IC12	E2	IC303	H5
IC13	E3	IC304	H5
IC14	E3	IC305	G6
IC15	E4	IC306	G6
IC16	B4	IC307	H6
IC17	E4	IC308	H6
IC18	E4	IC309	G6
IC19	B4	IC310	G6
IC20	C5	IC311	H6
IC22	B1	IC312	H6
IC23	D1	IC313	G4
IC24	B5	IC314	G4
IC25	E1	IC315	H4
IC26	E2	IC316	F4
IC27	D4	IC317	F2
IC28	D4	IC318	G4
IC30	D4	IC320	F2
IC31	B4	L1	B2
IC32	C2	L2	B2
IC33	D2	L3	B2
IC34	C3	L4	B3
IC35	D3	L5	B3
IC36	C3	L6	B3
IC37	D3	L7	C2
*IC201	D6	L9	C2
*IC202	C5	L11	C3
*IC203	D6	L13	B5
*IC204	D5	L14	B5
*IC205	E6	L15	C5
*IC206	C6	L16	D2
*IC207	C7	L17	D2
*IC208	E6	L18	D3
*IC210	D6	L20	D2
*IC211	D7	L21	D2
*IC214	D6	L22	D3
*IC215	D7	L23	D2
*IC218	E6	L24	E2
*IC219	E7	L301	H4
*IC220	F6	L302	H2
*IC222	E6	L303	G2
*IC223	E7	L304	H3
*IC226	F6	L305	H3
*IC227	F7	L306	H2
*IC229	F6	L307	H3
*IC230	F6	L308	H2
*IC231	F7		

* B SIDE

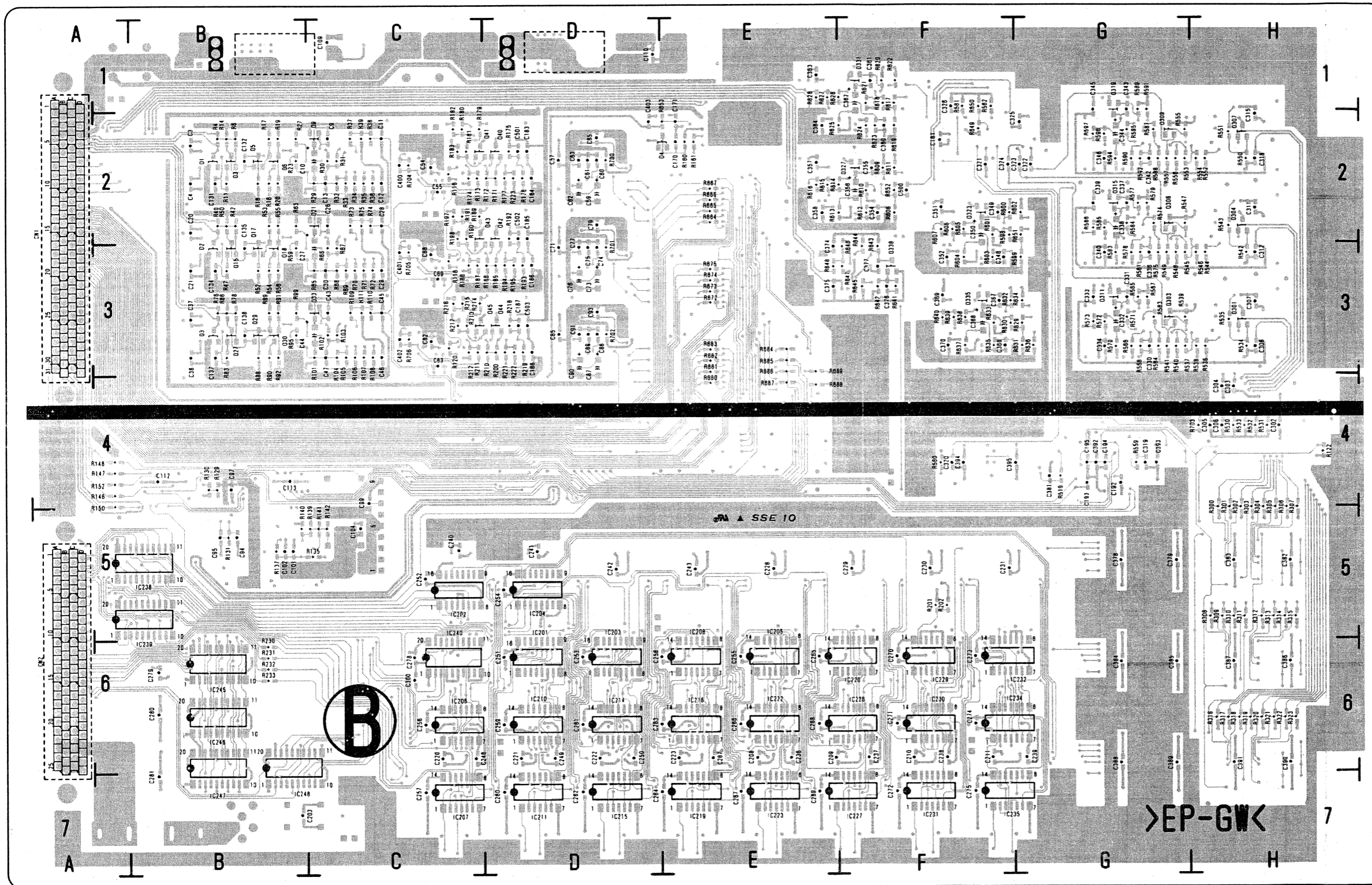


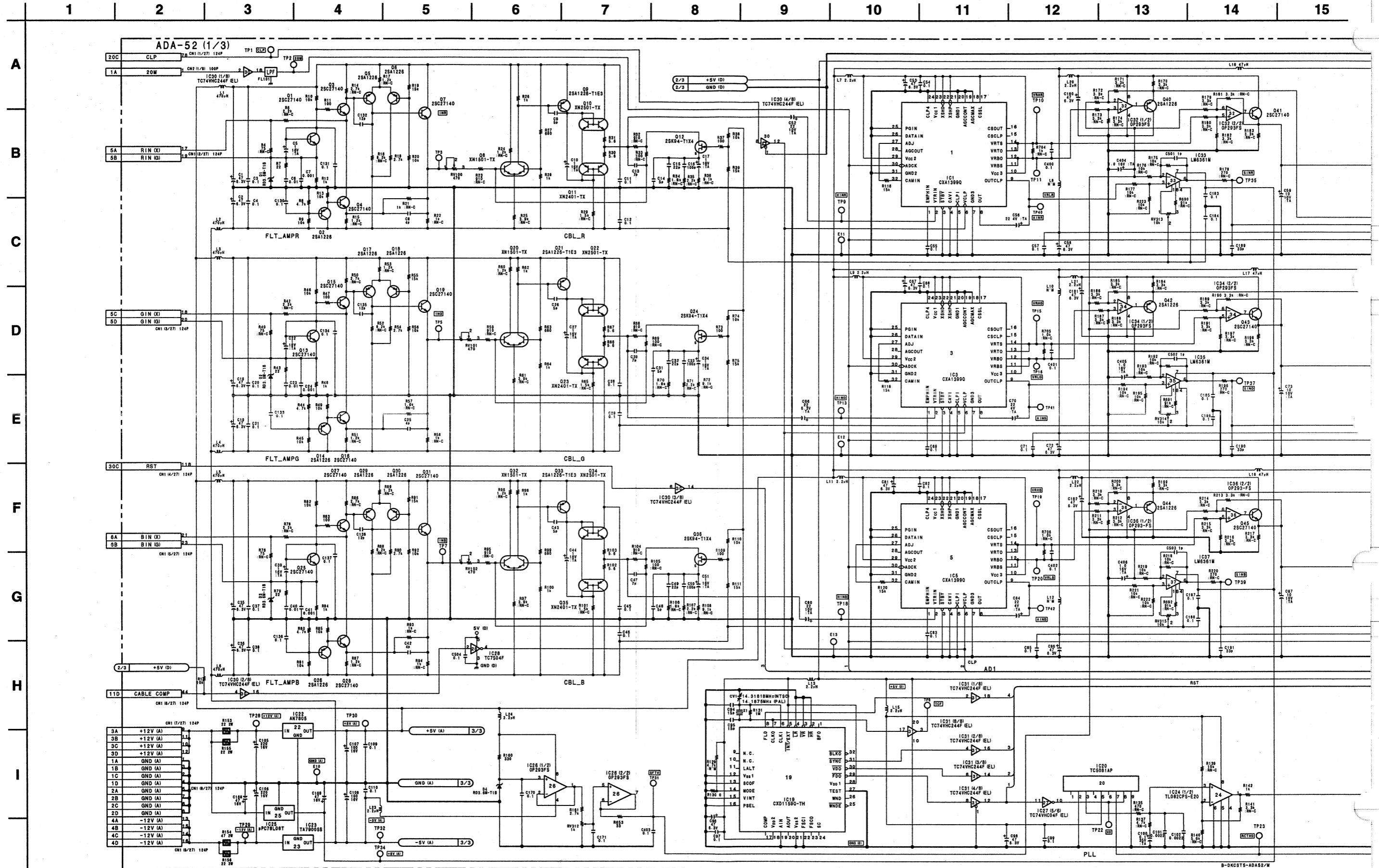
ADA-52 A SIDE
1-665-494-11

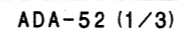
ADA-52 BOARD(2/2)

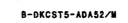
L309	H2	Q333	F1
L311	E3	Q334	G3
L312	F3	* Q335	F3
L313	F2	Q336	F3
L314	F3	Q337	F3
L315	F2	* Q338	F3
L316	F2	Q339	F3
L317	F1	Q340	F3
L318	F2	RV100	B2
L319	F3	RV101	B3
L320	F3	RV102	B3
Q1	B2	RV301	H4
Q2	B2	RV302	G3
* Q3	B2	RV303	G2
Q4	B2	RV304	G2
* Q5	B2	RV305	G3
* Q6	B2	RV306	F2
Q7	B2	RV307	F2
Q8	C2	RV308	G3
* Q9	C2	RV309	G3
Q10	C2	RV310	G3
Q11	C2	RV311	G2
Q12	C2	RV312	E2
Q13	B3	RV313	D2
Q14	B3	RV314	D3
* Q15	B3	RV315	D3
Q16	B2	S1	H4
* Q17	B3	TP1	D4
* Q18	B3	TP2	C4
Q19	B3	TP3	B2
* Q20	C3	TP5	B2
* Q21	C2	TP7	B3
Q22	C2	TP8	B5
Q23	C3	TP9	C2
Q24	C3	TP10	C2
Q25	B3	TP11	C2
Q26	B3	TP13	C2
* Q27	B3	TP15	C2
Q28	B3	TP16	C3
* Q29	B3	TP18	C3
* Q30	B3	TP19	C3
Q31	B3	TP20	C3
* Q32	C3	TP22	C4
* Q33	C3	TP23	B5
Q34	C3	TP26	B5
Q35	C3	TP28	B1
* Q36	C3	TP29	C1
* Q40	D2	TP30	C1
* Q41	C2	TP31	D4
* Q42	D2	TP32	E1
* Q43	C2	TP33	B4
* Q44	D3	TP34	E2
* Q45	C3	TP35	D2
* Q301	H3	TP36	D2
Q302	G3	TP37	D3
* Q303	G3	TP38	D3
* Q304	H2	TP39	D3
* Q305	G2	TP40	D2
* Q306	G2	TP41	D3
* Q307	H2	TP42	D3
* Q308	G2	TP43	F2
* Q309	G2	TP44	G2
Q310	G3	TP45	G2
* Q311	G3	TP46	F4
Q312	G3	TP47	D3
Q313	G3	TP201	C7
Q314	G2	TP202	C7
* Q315	G2	TP301	H2
Q316	G2	TP303	H3
Q317	G2	TP304	H2
Q318	G2	TP310	F1
* Q319	G1	TP311	F1
Q320	G2	TP312	G1
Q321	G2	TP313	G3
* Q322	G2	TP314	G2
* Q323	F2	TP315	G2
Q324	F2	TP317	F2
Q325	F2	TP318	E2
Q326	F2	TP319	E1
* Q327	F2	TP320	F3
Q328	F2	TP321	E3
Q329	F2	X1	B5
Q330	F1	X2	C5
* Q331	F1	X301	G4
Q332	F1		

* B SIDE









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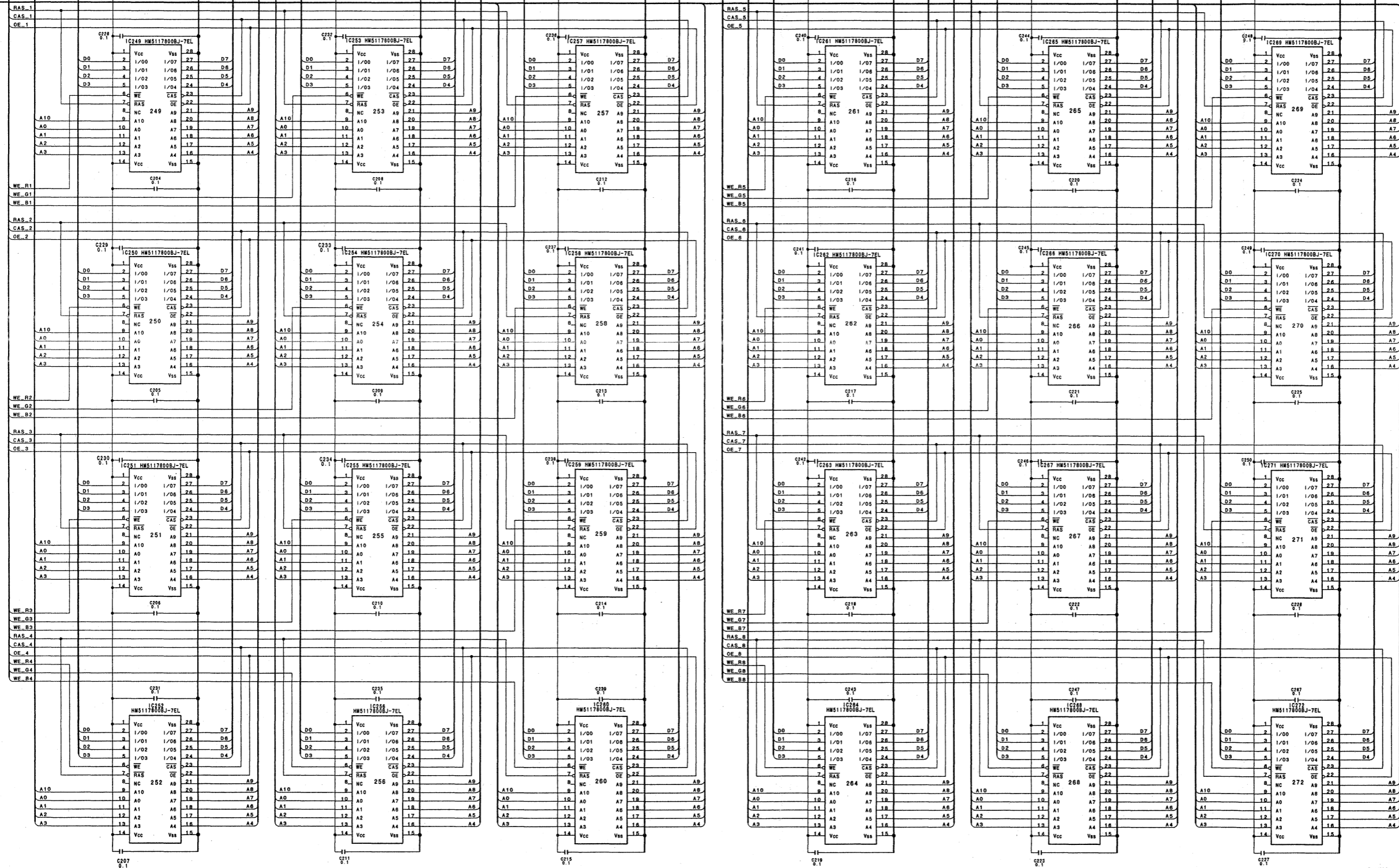
27

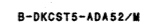
28

29

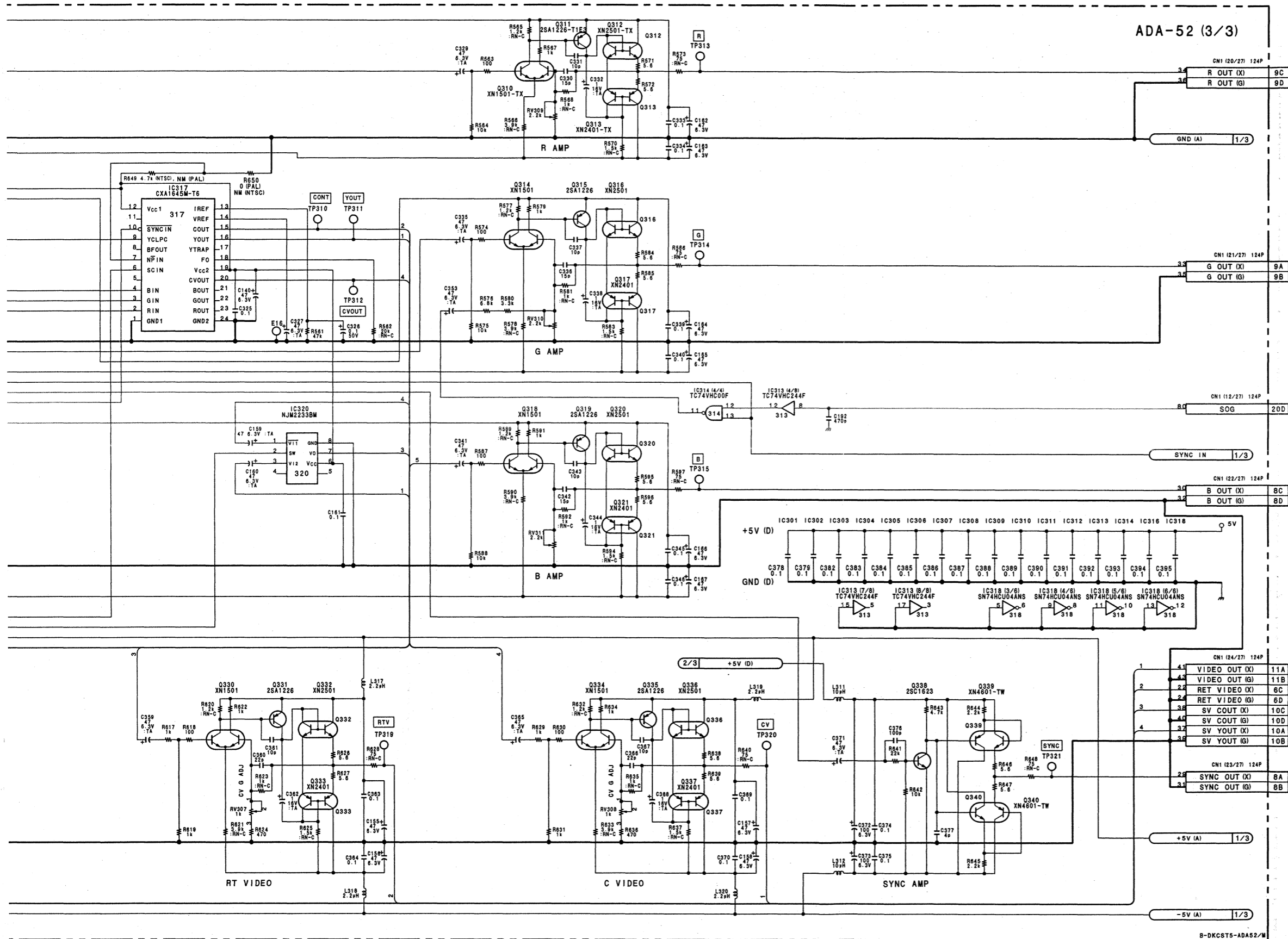
30

ADA-52 (2/3)



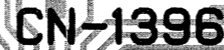


16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

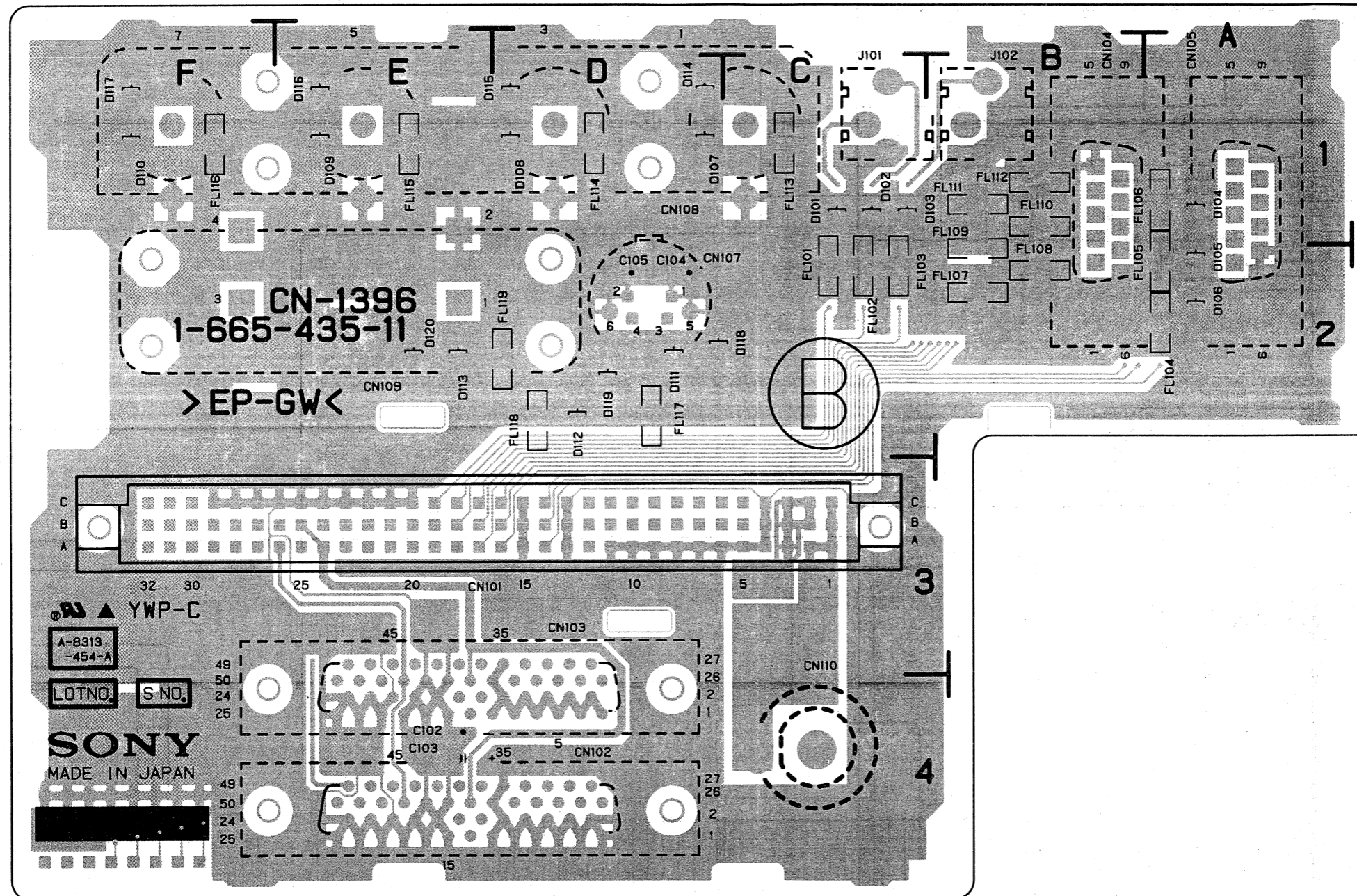


* CN101	F3
CN102	E4
CN103	E4
CN104	B1
CN107	D2
CN108	C1
CN109	E2
CN110	C4
* D102	C1
* D107	D1
* D108	D1
* D109	E1
* D110	F1
* D111	D2
* D112	D2
* D113	E2
* D114	D1
* D115	D1
* D116	E1
* D117	F1
* D118	D2
* D119	D2
* D120	E2
* FL102	C2
* FL107	B2
* FL108	B2
* FL109	B2
* FL110	B1
* FL111	B1
* FL112	B1
* FL113	C1
* FL114	D1
* FL115	E1
* FL116	F1
* FL117	D2
* FL118	D2
* FL119	D2
J101	C1
SW101	F4

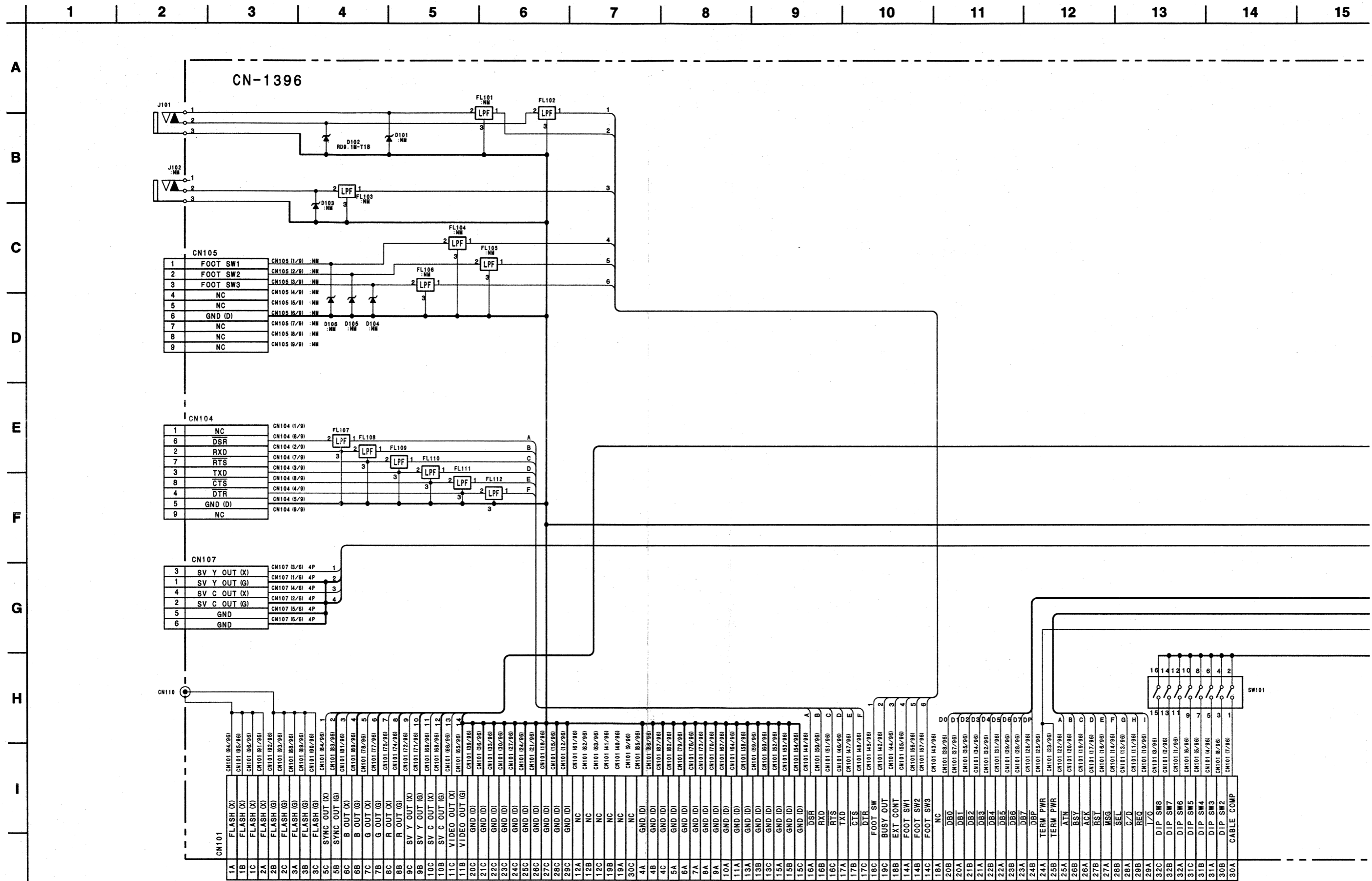
* B SIDE

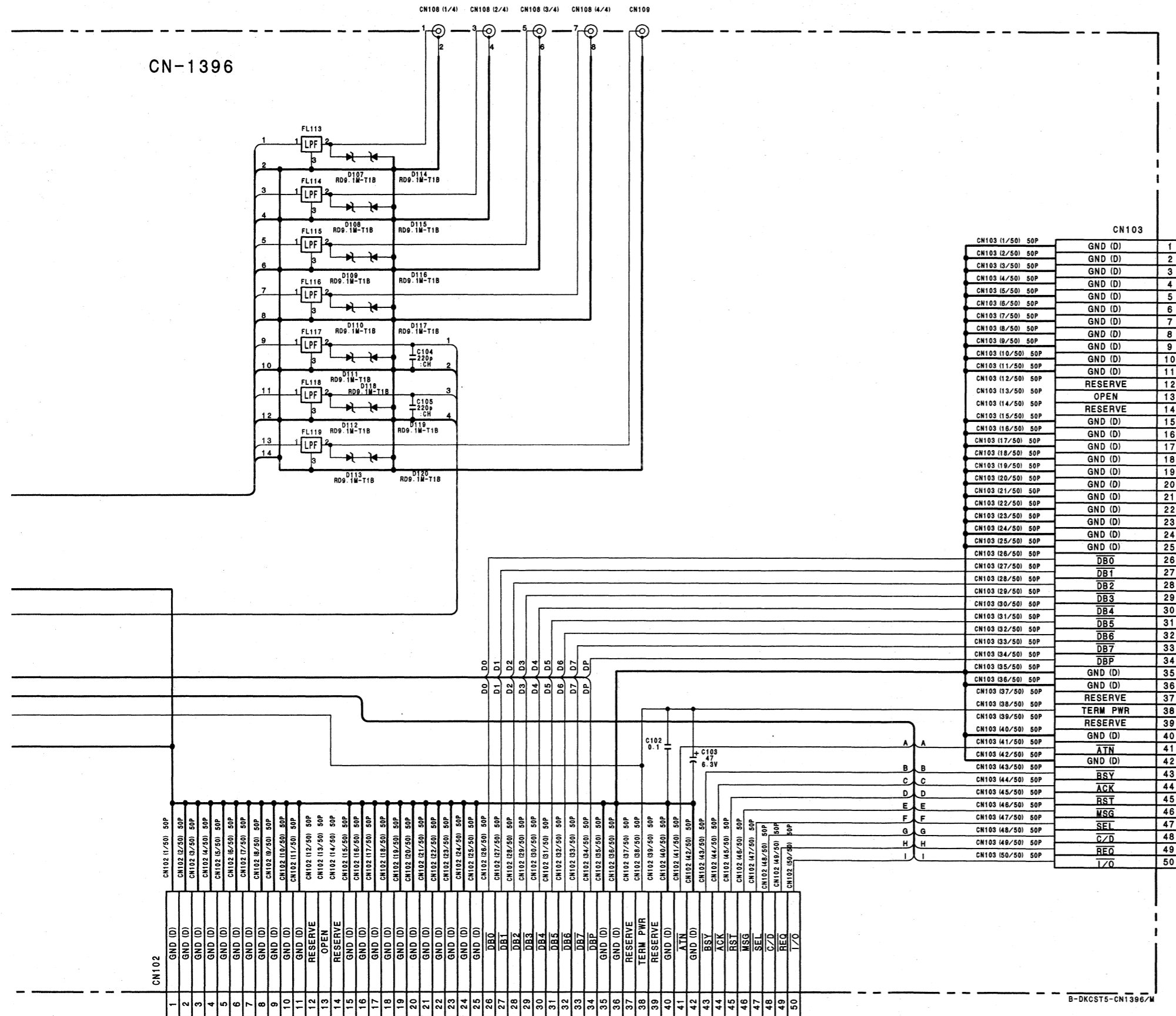


CN-1396 A SIDE
1-665-435-11



CN-1396 B SIDE
1-665-435-11

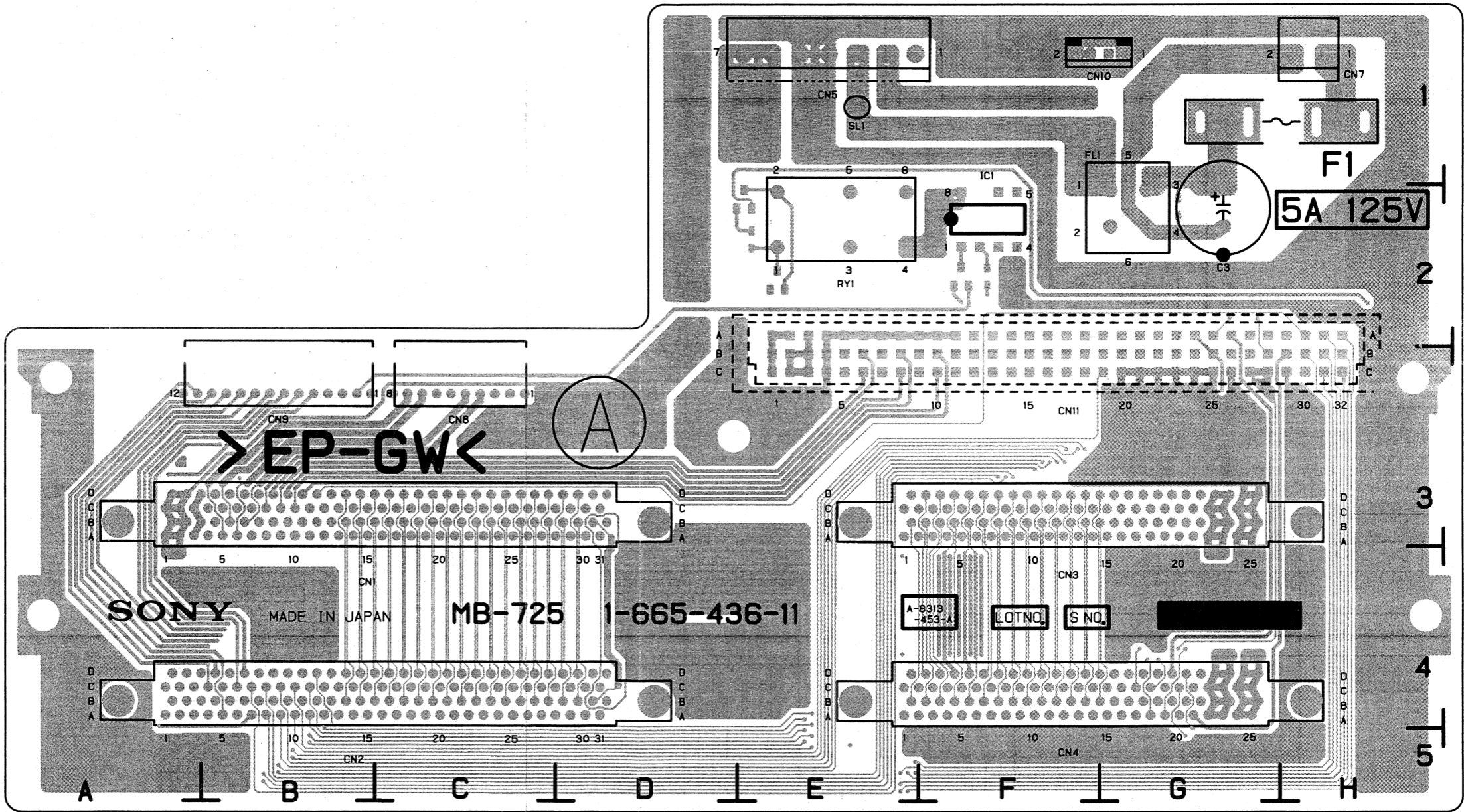




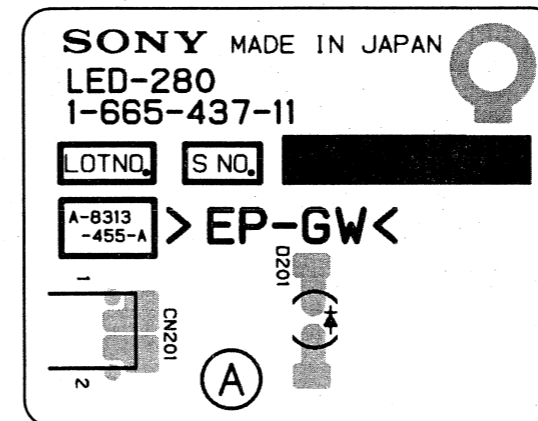
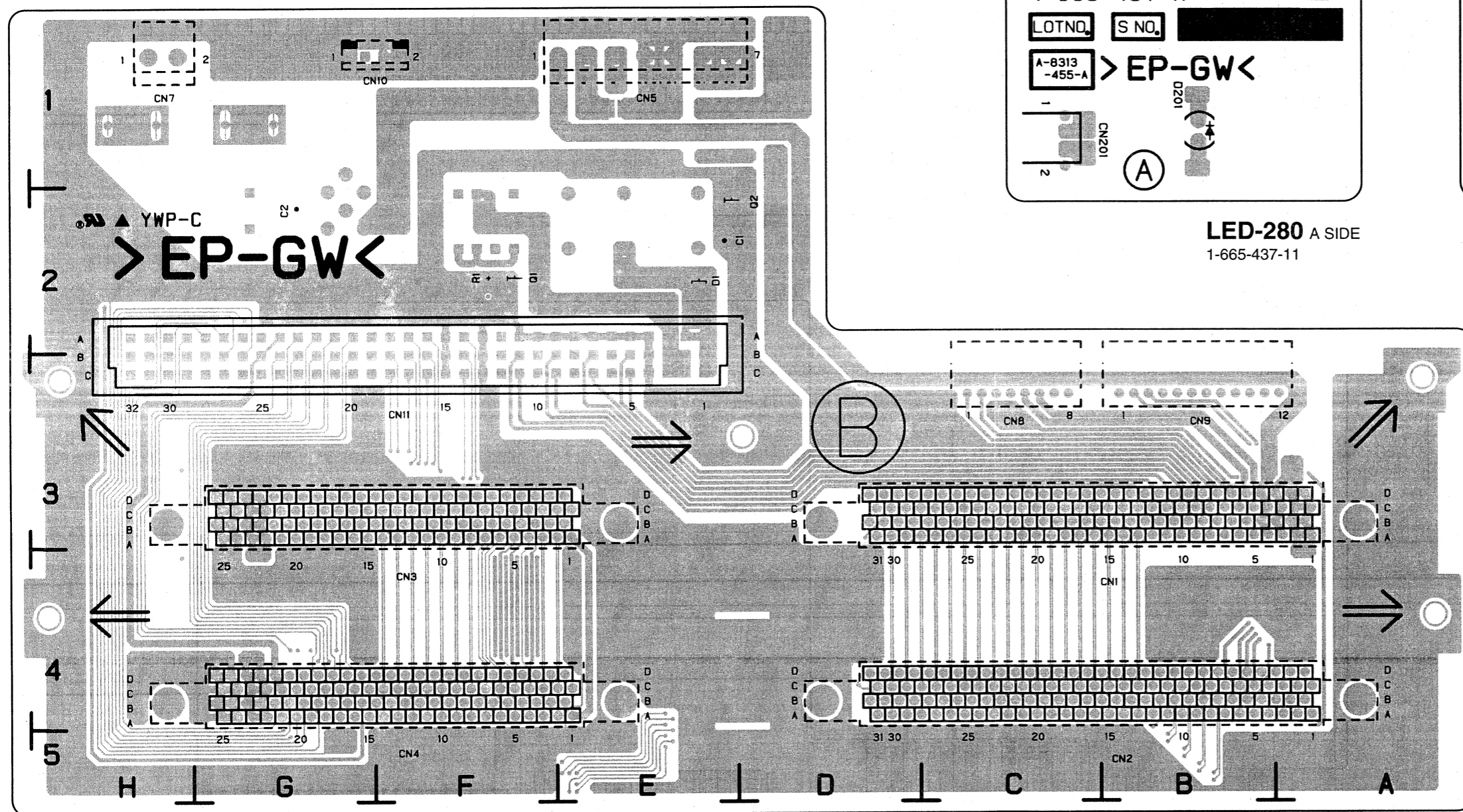
MB-725 BOARD

CN1	A3
CN2	A4
CN3	E3
CN4	E4
CN5	E1
CN7	H1
CN8	C3
CN9	B3
CN10	G1
*CN11	E2
*D1	E2
FH1	G1
FH2	H1
FL1	G2
F1	G1
IC1	F2
*Q1	E2
*Q2	E2
RY1	E2

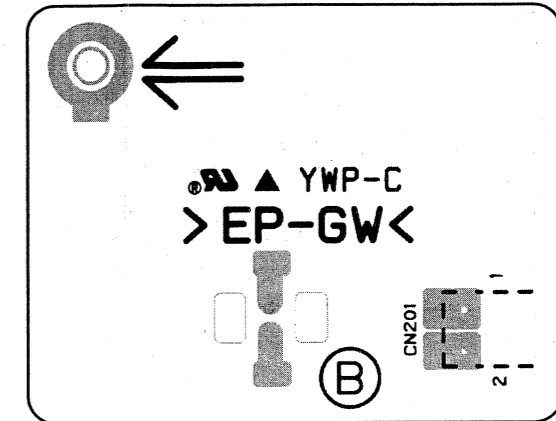
* B SIDE



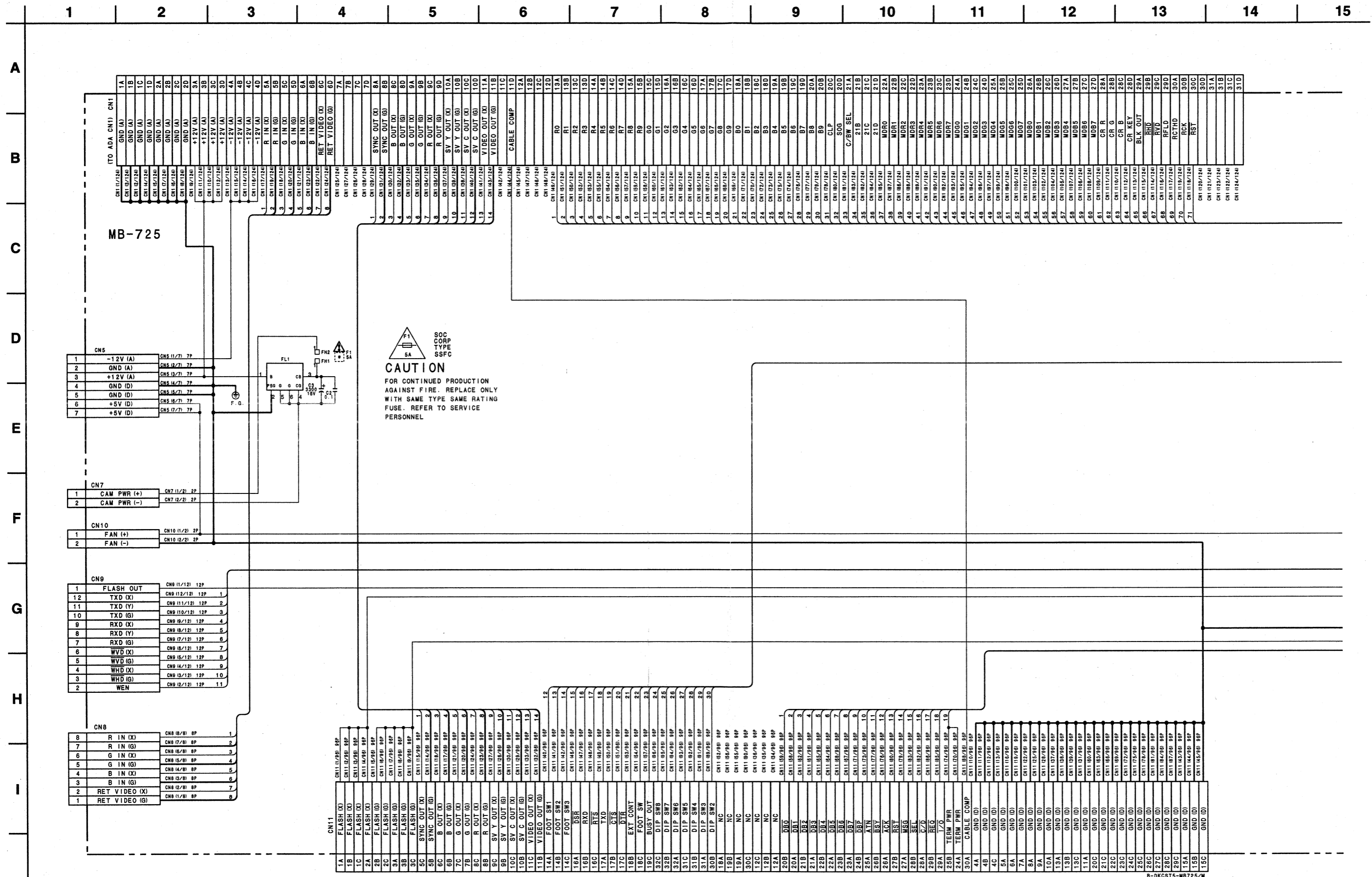
MB-725 A SIDE
1-665-436-11

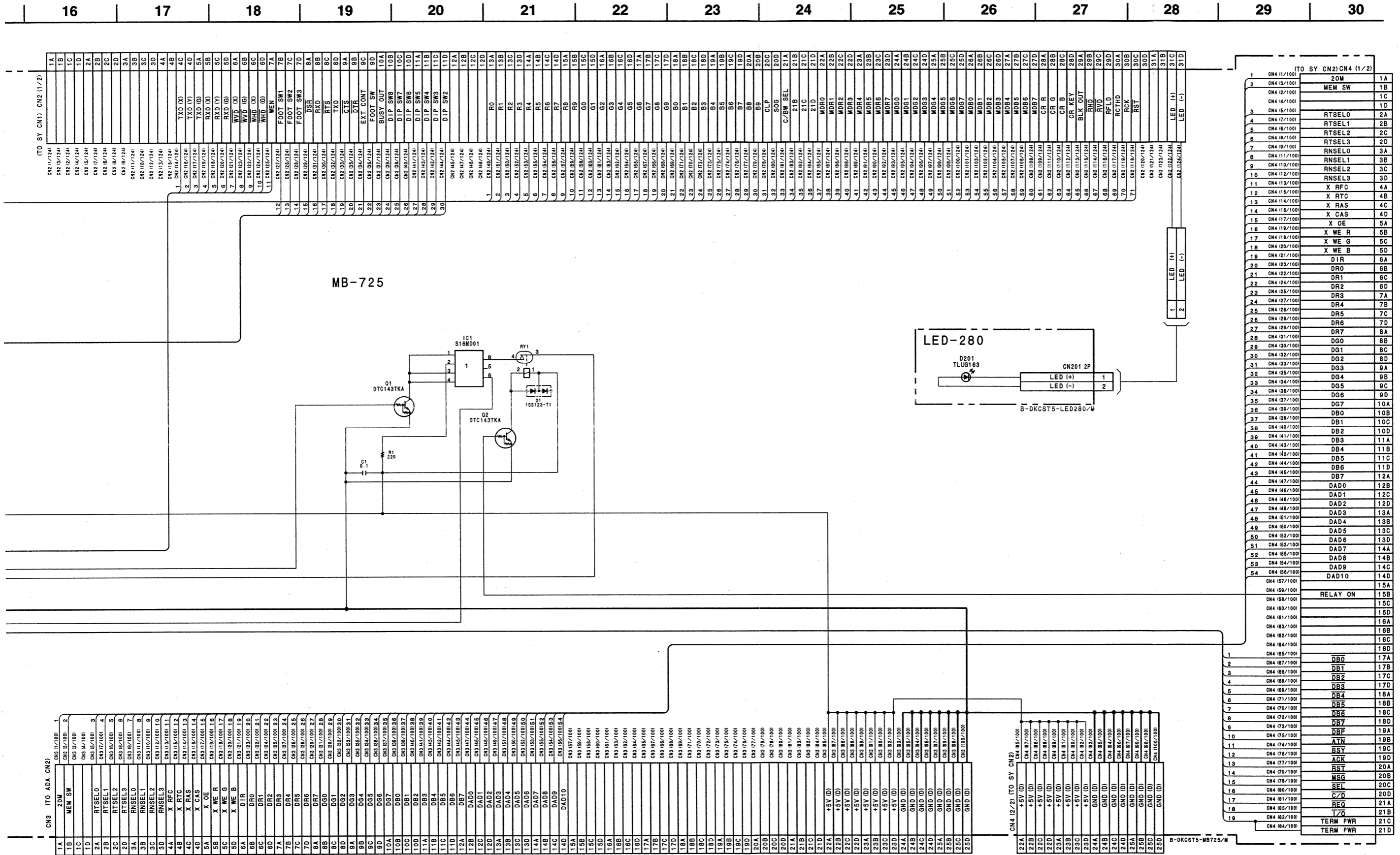


LED-280 A SIDE
1-665-437-11



LED-280 B SIDE
1-665-437-11

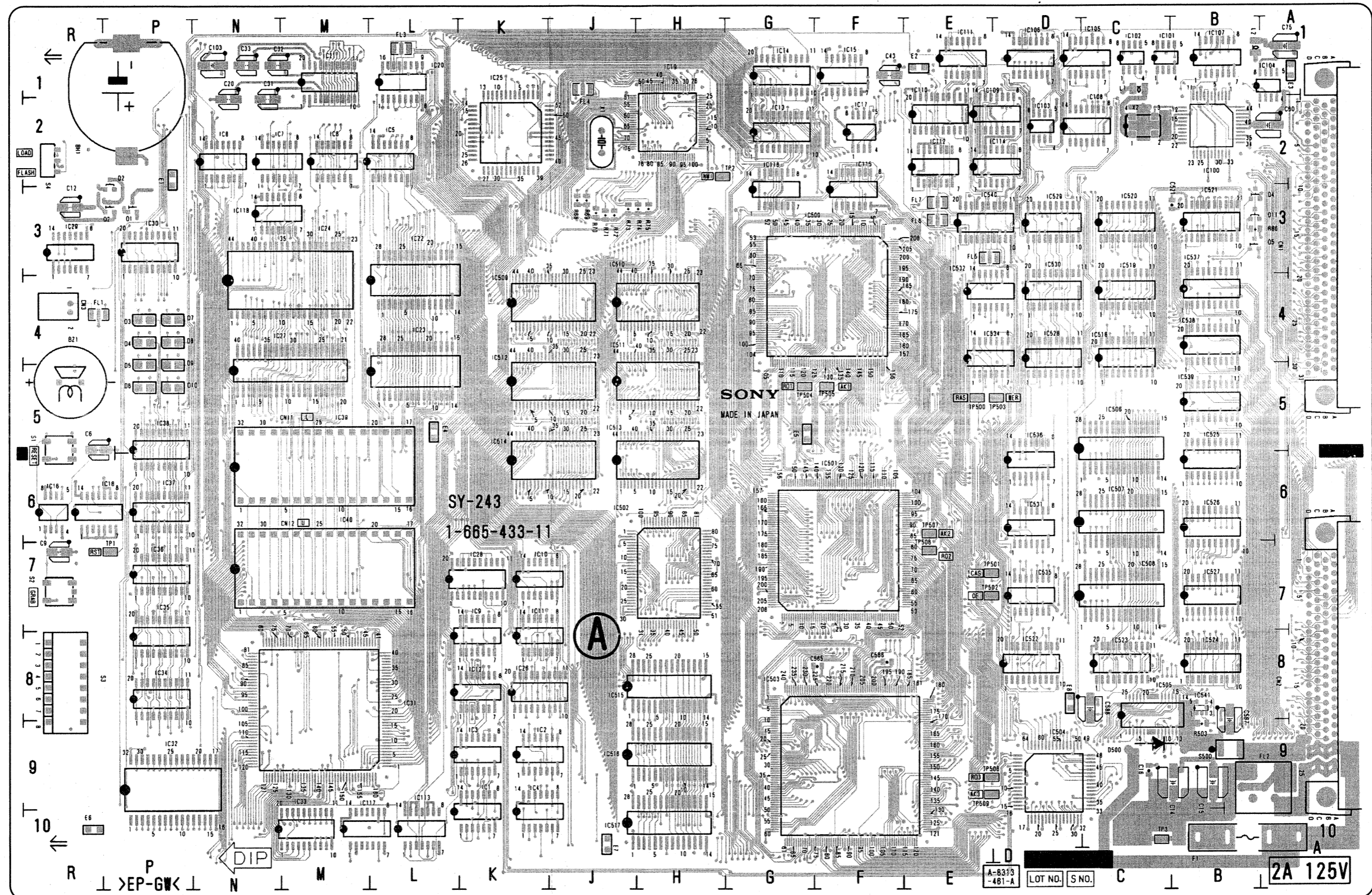


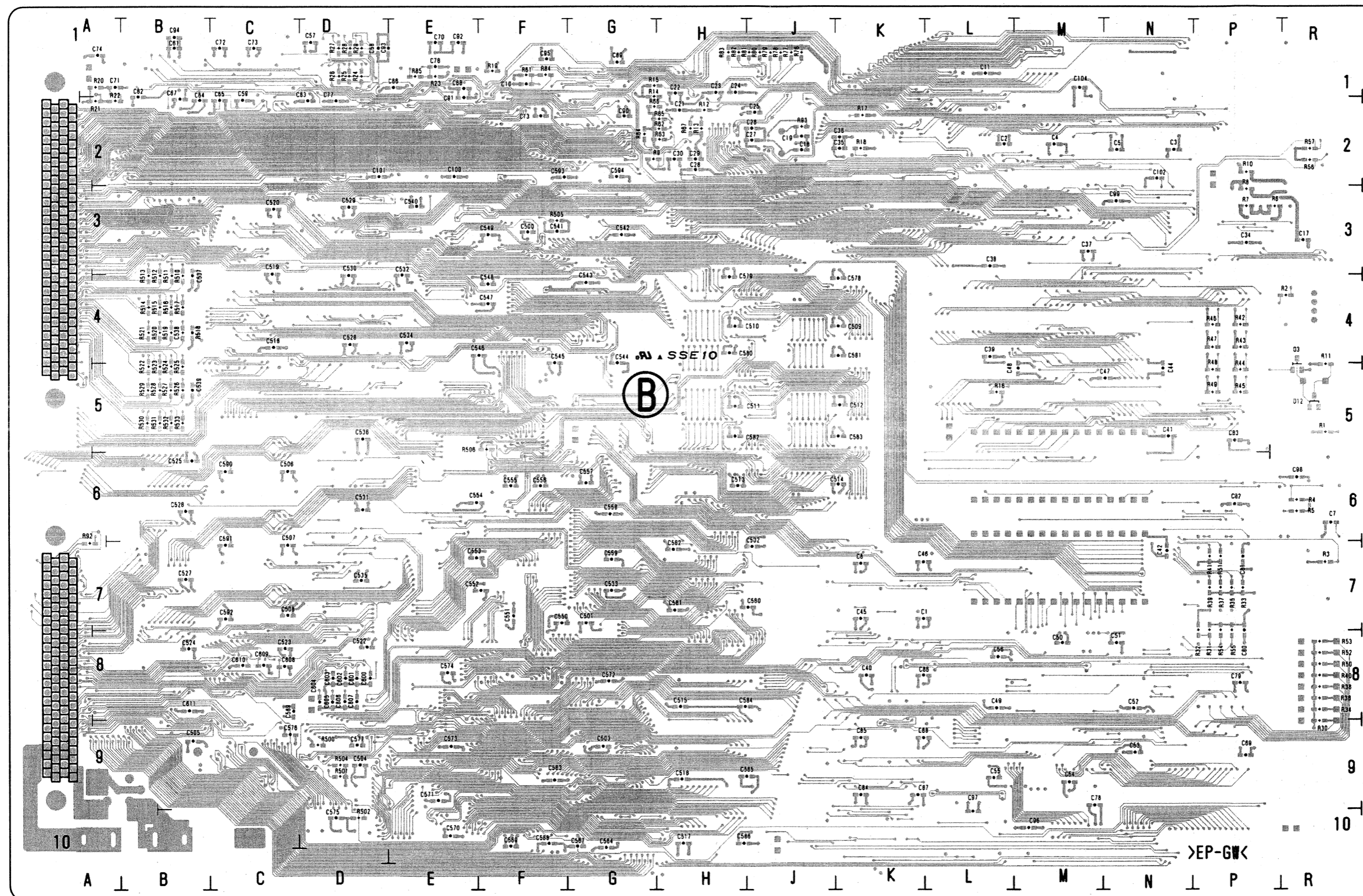


SY-243 BOARD

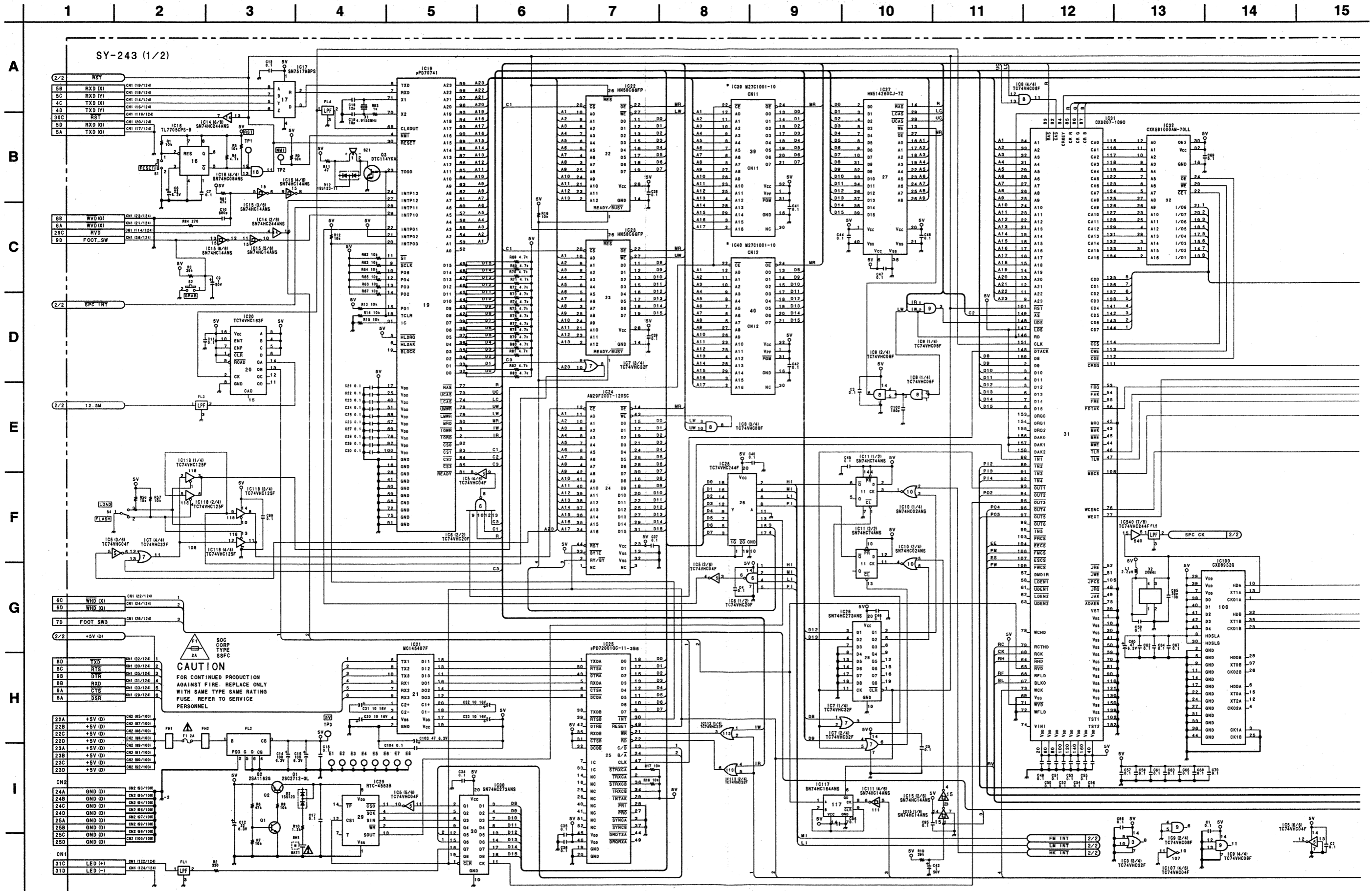
BAT1	P1	IC104	A1
BH1	P1	IC105	C1
BZ1	R5	IC106	D1
CNI1	N6	IC107	B1
CNI2	N7	IC108	C2
CN1	A2	IC109	D2
CN2	A7	IC110	E2
D2	P2	IC111	E1
D3	P4	IC112	E2
D4	P4	IC113	L10
D5	P5	IC114	D2
D6	P5	IC115	F3
D7	P4	IC116	G3
D8	P4	IC117	M10
D9	P5	IC118	N3
D10	P5	IC500	F4
D11	B3	IC501	F7
* D12	R5	IC502	H7
D500	C9	IC503	F9
E1	P2	IC504	D9
E2	E1	IC505	C8
E3	A1	IC506	C5
E4	L5	IC507	C6
E5	G5	IC508	C7
E6	R10	IC509	J4
E7	J10	IC510	H4
E8	D8	IC511	H5
FH1	A10	IC512	J5
FH2	B10	IC513	H6
FL1	R4	IC514	J6
FL2	B9	IC515	H8
FL3	L1	IC516	H9
FL4	J1	IC517	H10
FL5	E3	IC518	C4
FL6	E3	IC519	C4
FL7	E3	IC520	C3
F1	A10	IC521	B3
IC1	K10	IC522	D8
IC2	K9	IC523	C8
IC3	K9	IC524	B8
IC4	K10	IC525	B6
IC5	L2	IC526	B6
IC6	M2	IC527	B7
IC7	N2	IC528	D4
IC8	N2	IC529	D3
IC9	K8	IC530	D4
IC10	K7	IC531	D6
IC11	K8	IC532	E4
IC12	K8	IC534	E4
IC13	G2	IC535	D7
IC14	G1	IC536	D6
IC15	F1	IC537	B4
IC16	R6	IC538	B4
IC17	F2	IC539	B5
IC18	R6	IC540	E3
IC19	H2	IC541	B8
IC20	L1	L1	C1
IC21	M1	L2	B1
IC22	L4	Q1	P3
IC23	L5	Q2	P3
IC24	M4	* Q3	R5
IC25	K2	S1	R5
IC26	K8	S2	R7
IC27	M5	S3	R8
IC28	K7	S4	R2
IC29	R3	S500	B9
IC30	P3	TP1	P7
IC31	M8	TP2	H2
IC32	P9	TP3	C10
IC33	M10	TP500	E5
IC34	P8	TP501	E7
IC35	P8	TP502	E7
IC36	P7	TP503	D5
IC37	P6	TP504	G5
IC38	P5	TP505	F5
IC39	N6	TP506	E7
IC40	N7	TP507	E6
IC100	B2	TP508	E9
IC101	C1	TP509	E9
IC102	C1	X1	J2
IC103	D2	X2	C2

* B SIDE

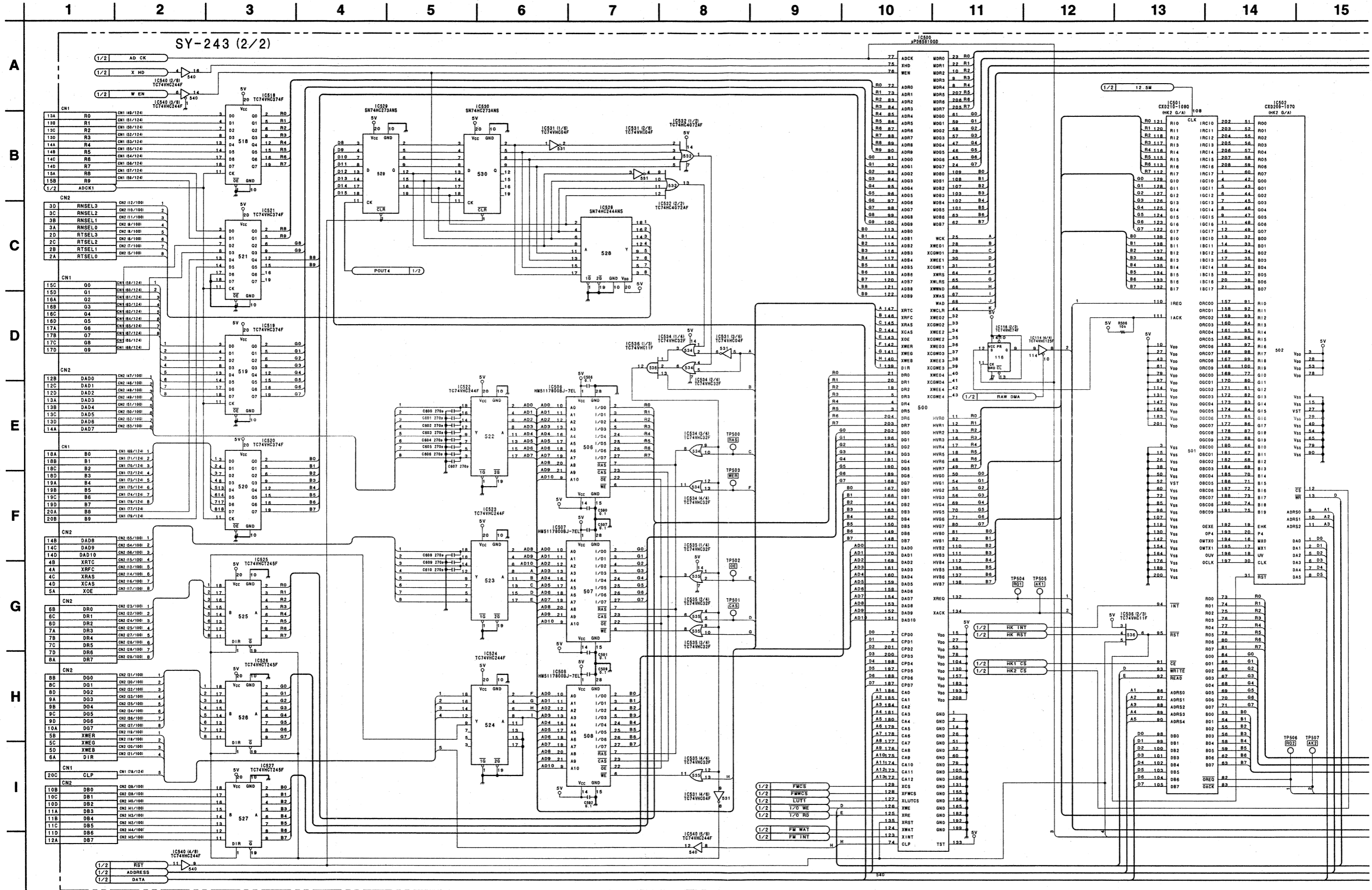
SY-243 A SIDE
1-665-433-11

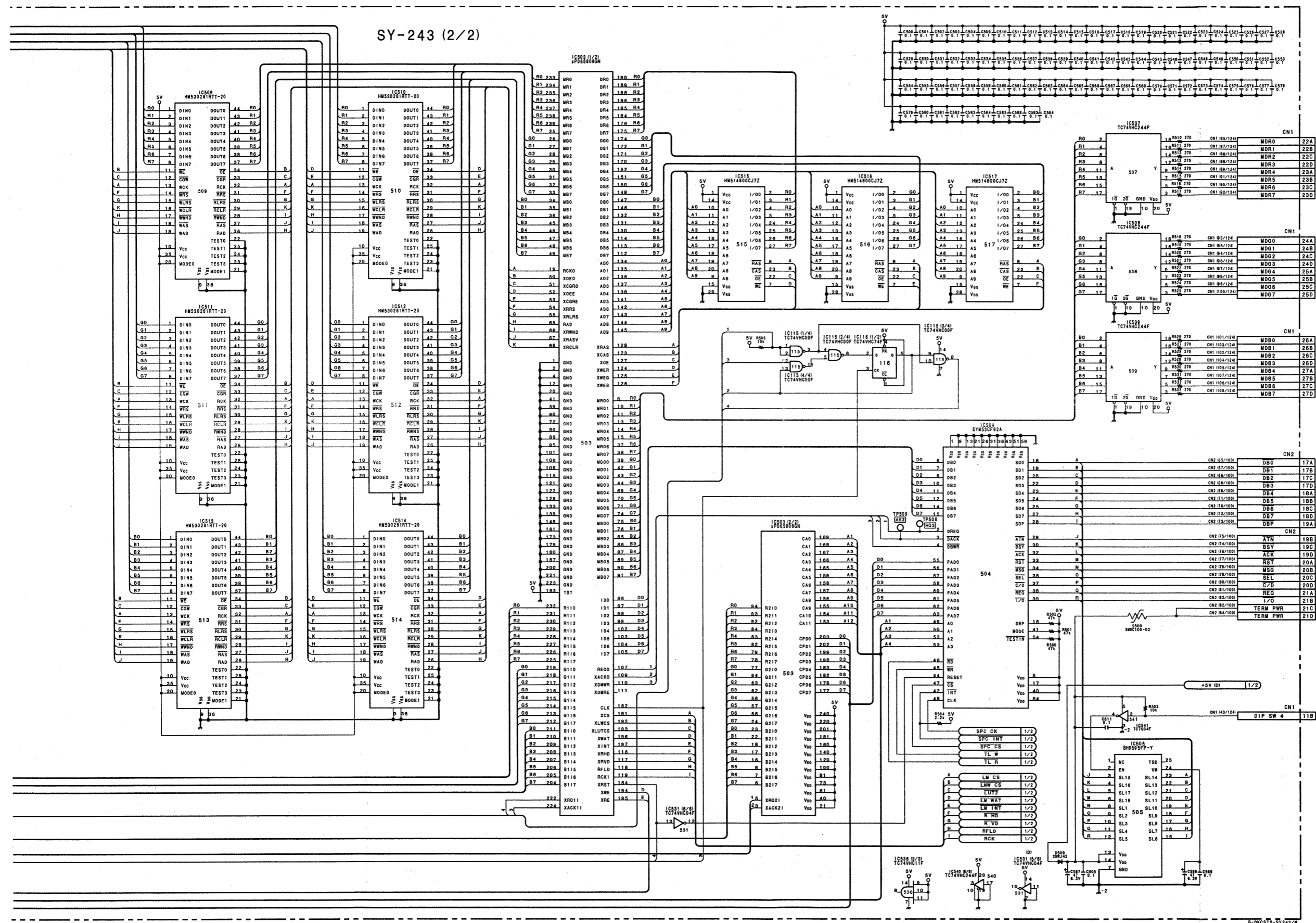
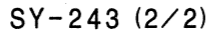


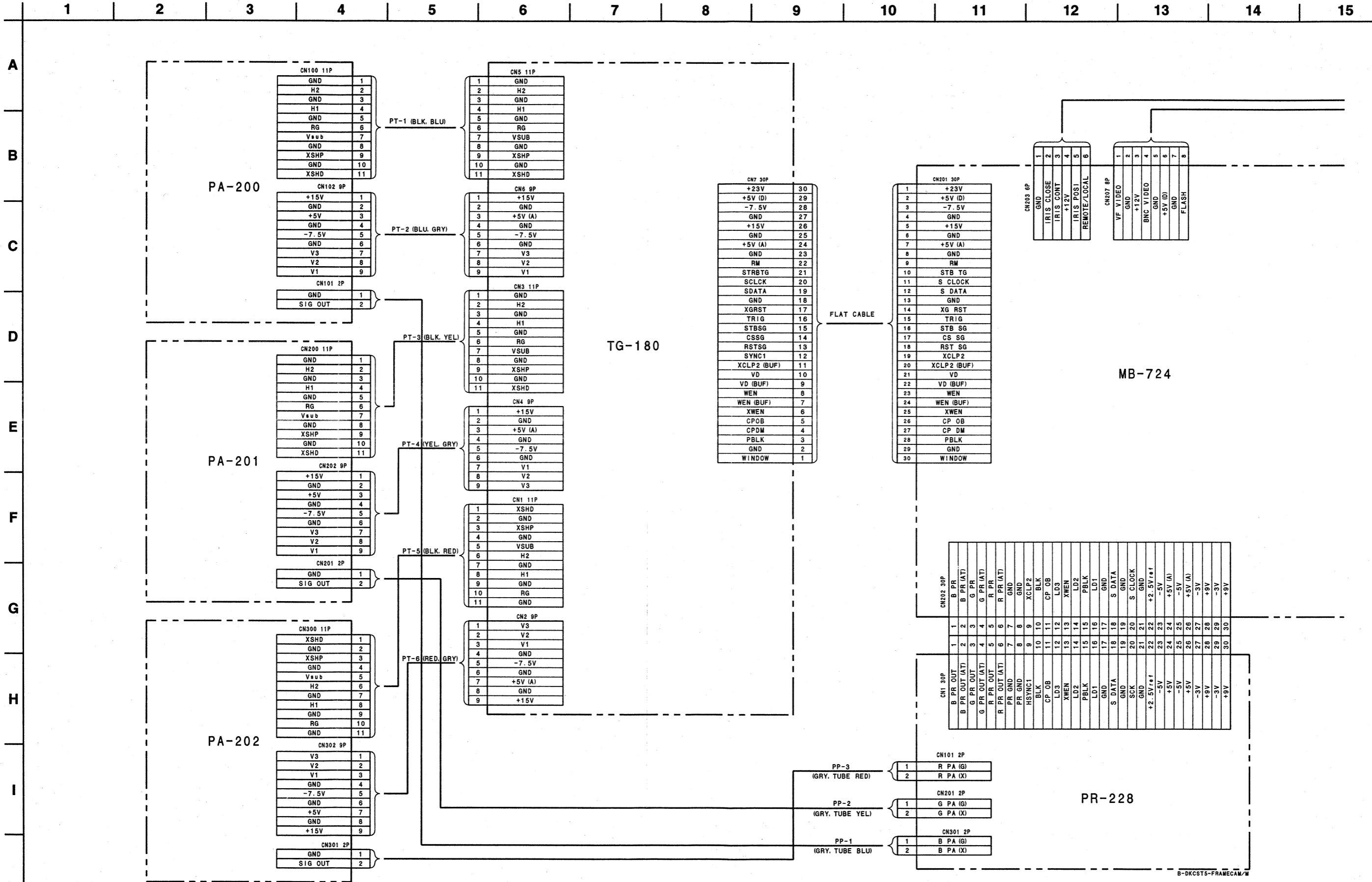
SY-243 B SIDE
1-665-433-11

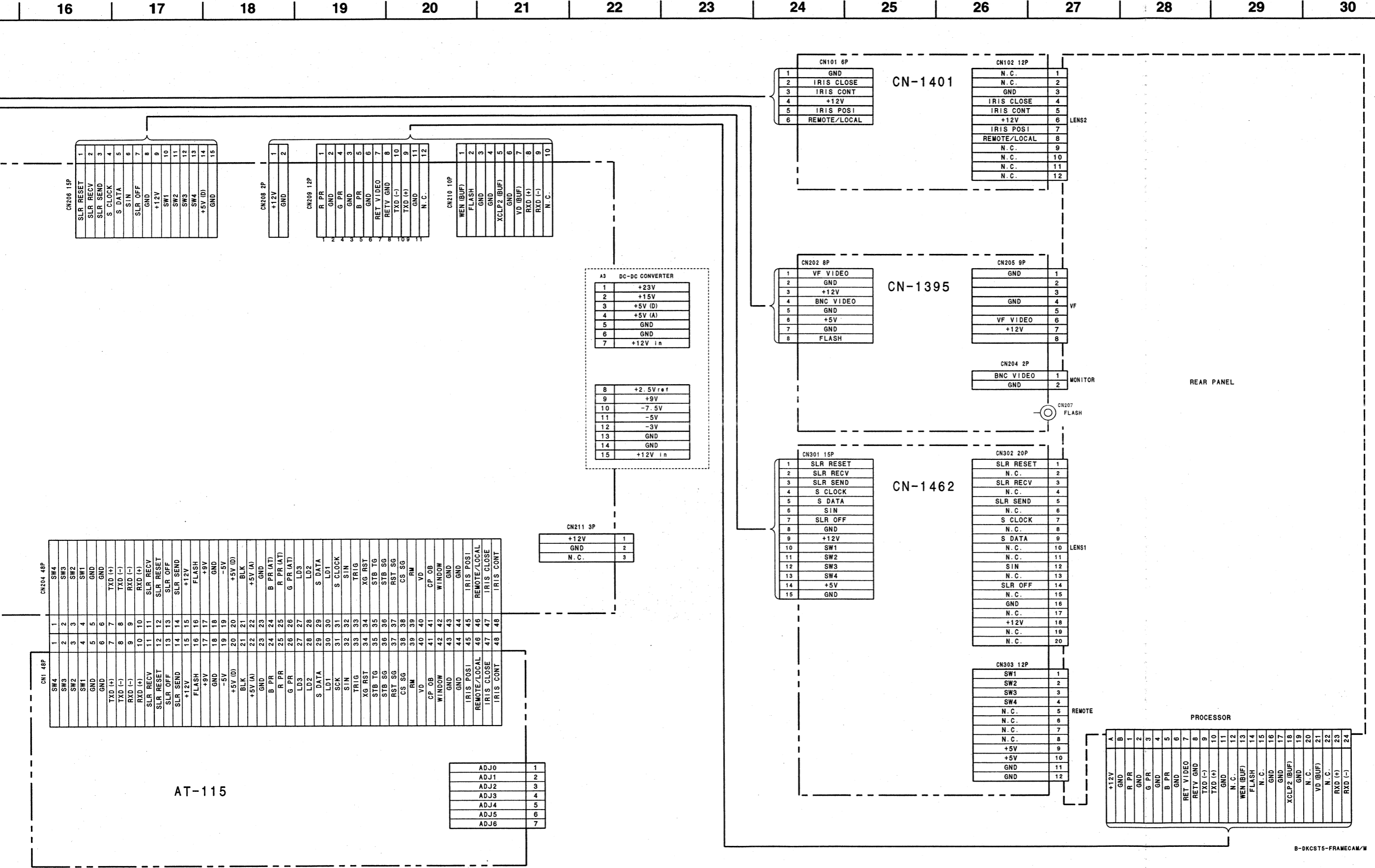




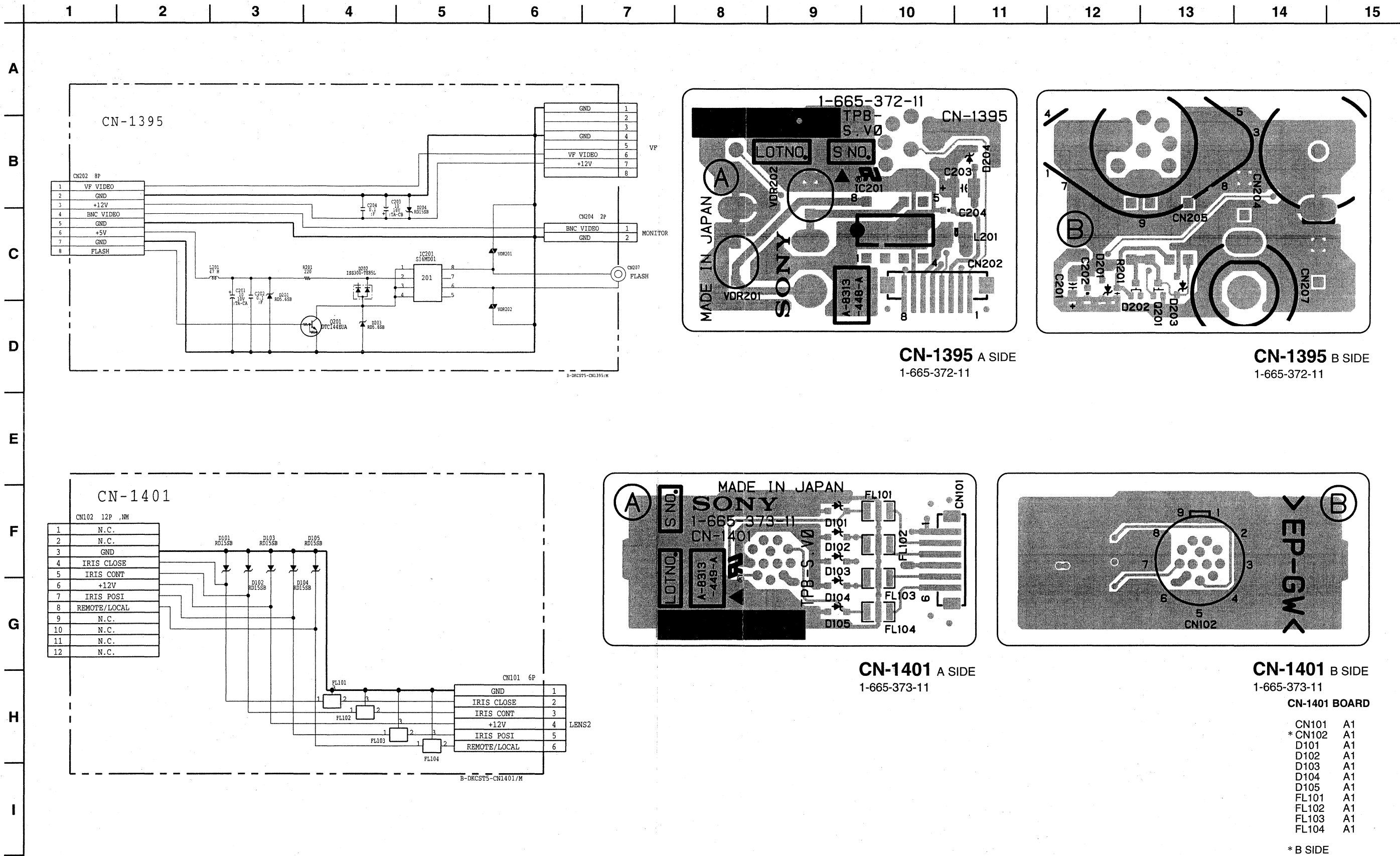








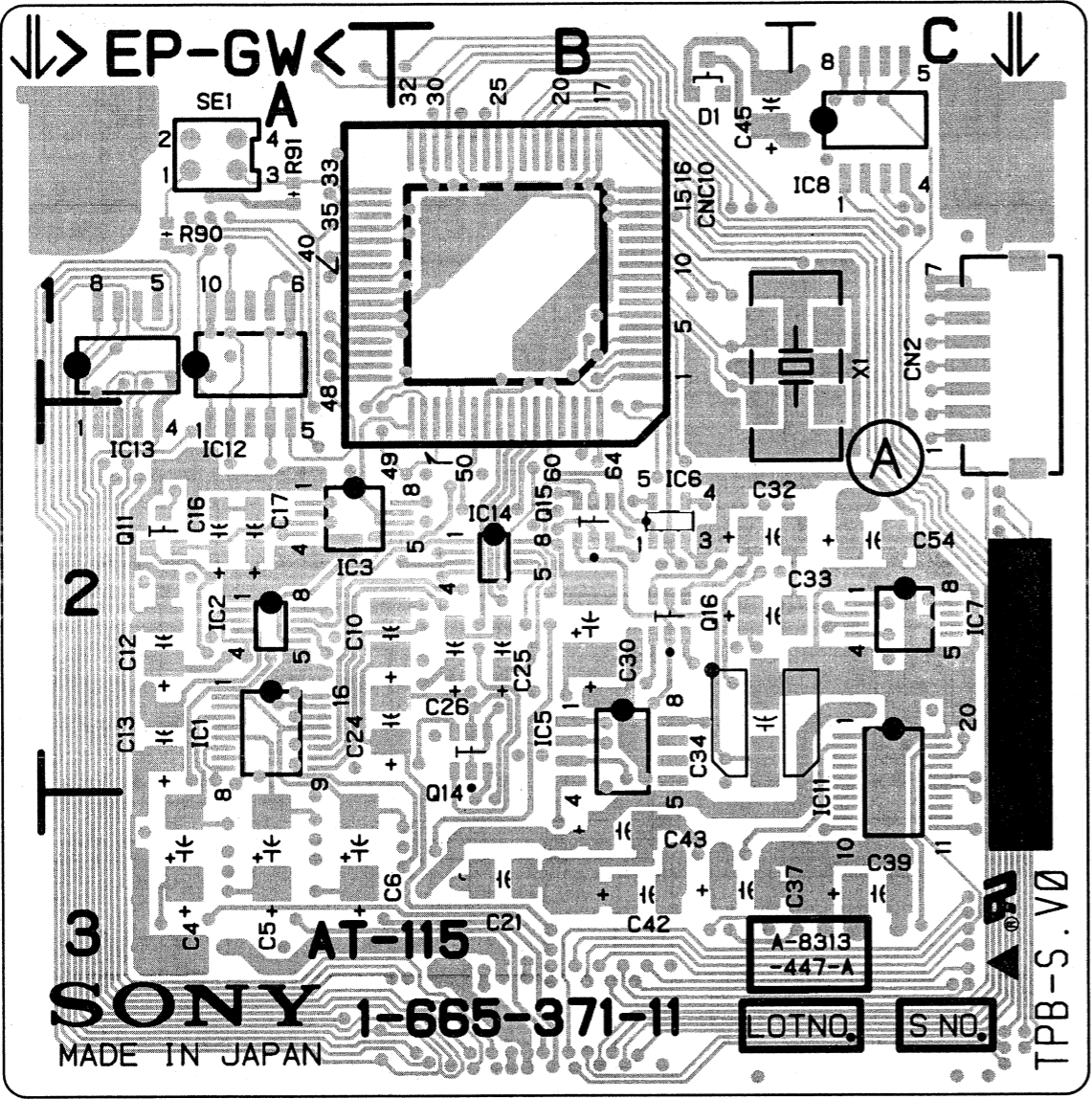
B-DKCST5-FRAMECAM/M



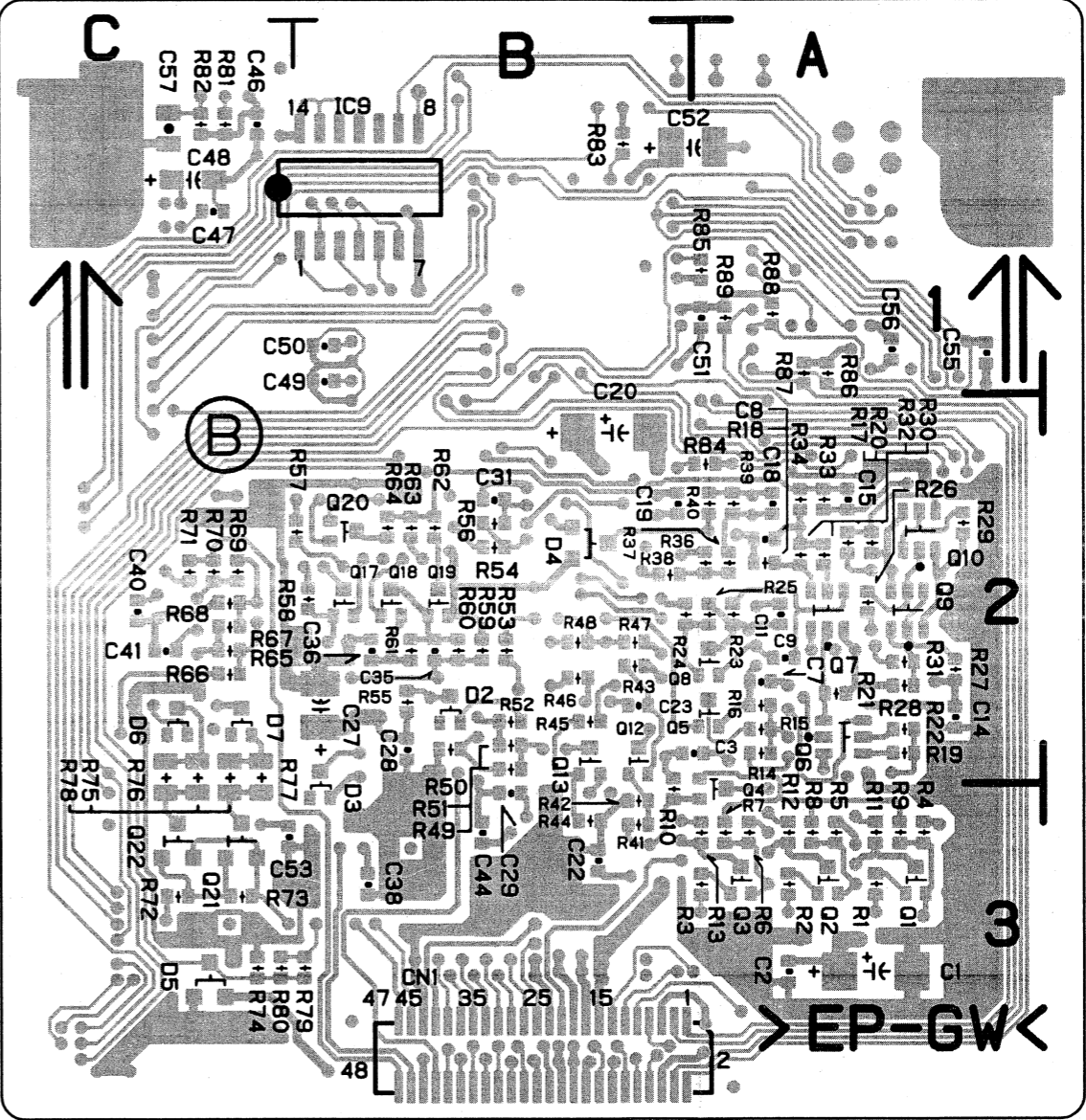
AT-115 BOARD

- | | |
|-------|----|
| * CN1 | B3 |
| CN2 | C1 |
| D1 | B1 |
| * D2 | B2 |
| * D3 | B3 |
| * D4 | B2 |
| * D5 | C3 |
| * D6 | C2 |
| * D7 | C2 |
| IC1 | A2 |
| IC2 | A2 |
| IC3 | A2 |
| IC5 | B2 |
| IC6 | B2 |
| IC7 | C2 |
| IC8 | C1 |
| * IC9 | B1 |
| IC10 | B1 |
| IC11 | C2 |
| IC12 | A1 |
| IC13 | A1 |
| IC14 | B2 |
| * Q1 | A3 |
| * Q2 | A3 |
| * Q3 | A3 |
| * Q4 | A3 |
| * Q5 | A2 |
| * Q6 | A2 |
| * Q7 | A2 |
| * Q8 | A2 |
| * Q9 | A2 |
| * Q10 | A2 |
| * Q11 | A2 |
| * Q12 | B2 |
| * Q13 | B2 |
| * Q14 | B2 |
| * Q15 | B2 |
| * Q16 | B2 |
| * Q17 | B2 |
| * Q18 | B2 |
| * Q19 | B2 |
| * Q20 | B2 |
| * Q21 | C3 |
| * Q22 | C3 |
| SE1 | A1 |
| X1 | C1 |

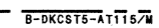
* B SIDE



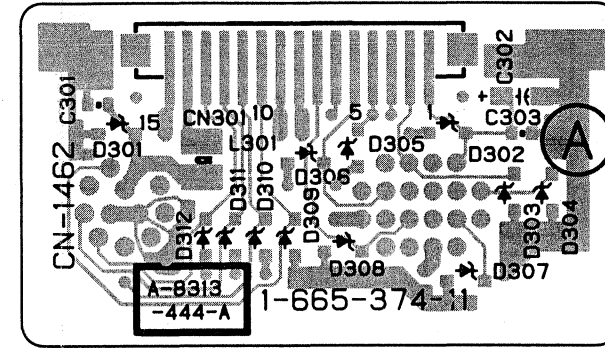
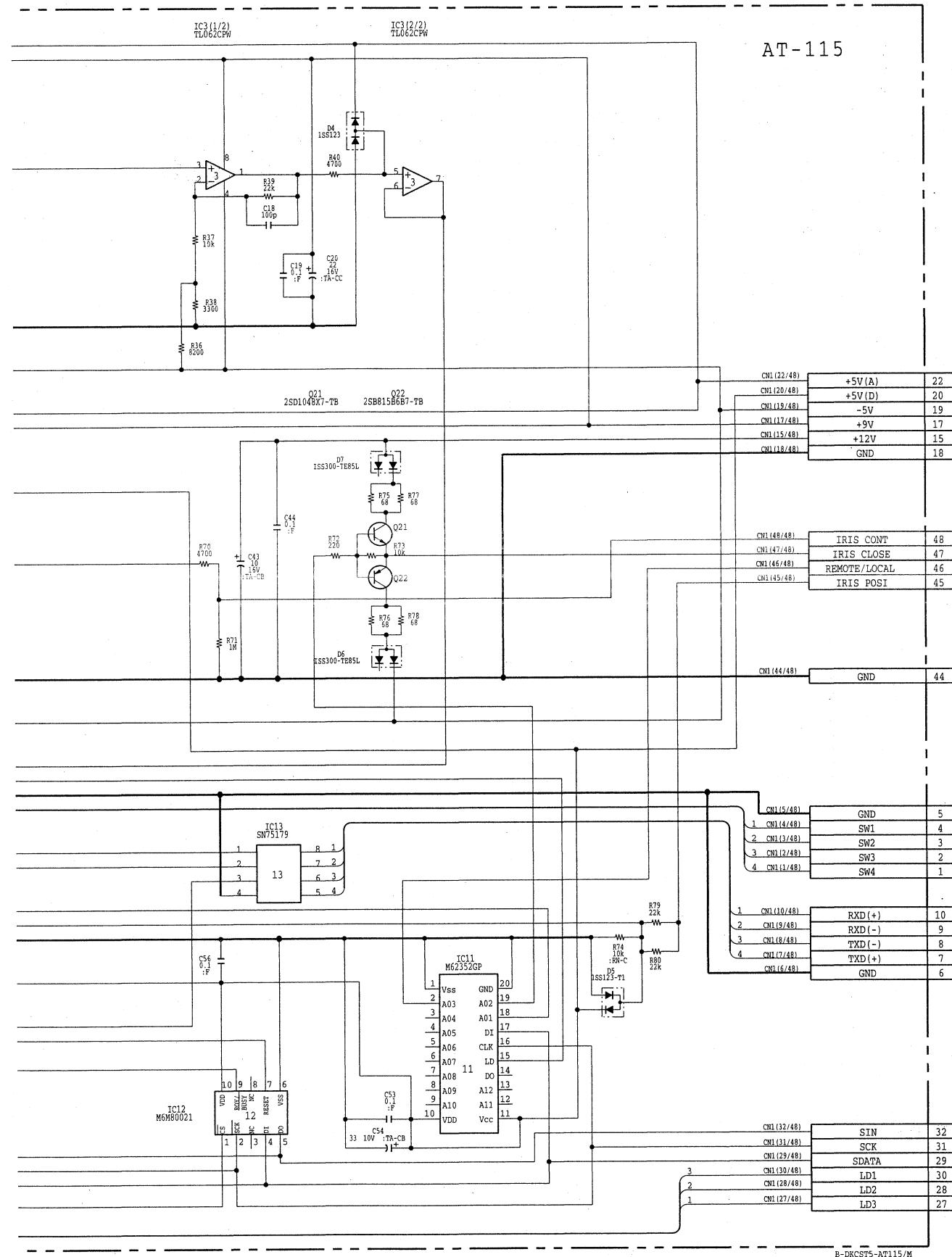
AT-115 A SIDE
1-665-371-11



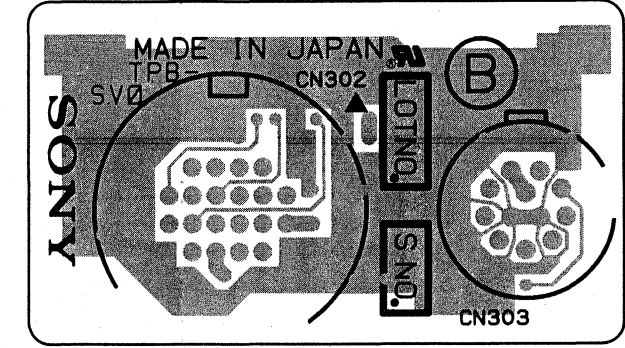
AT-115 B SIDE
1-665-371-11



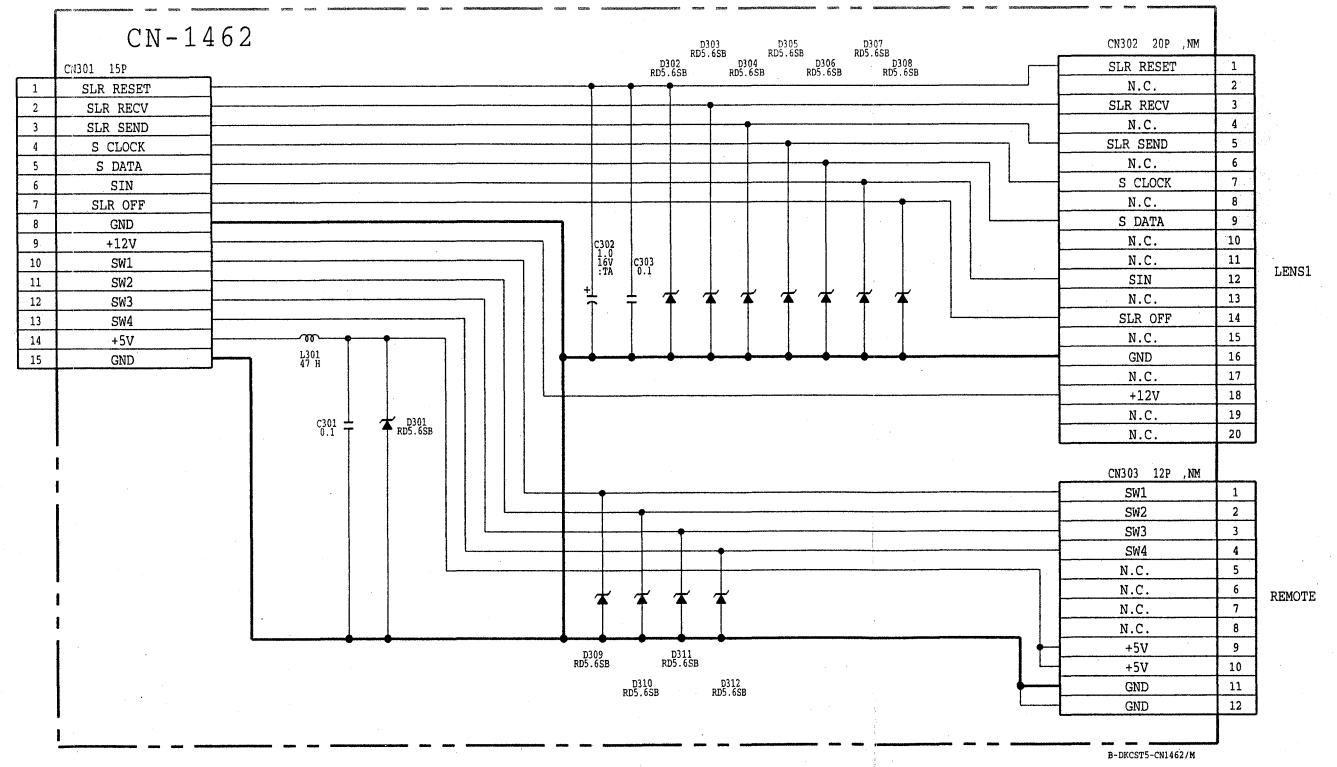
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

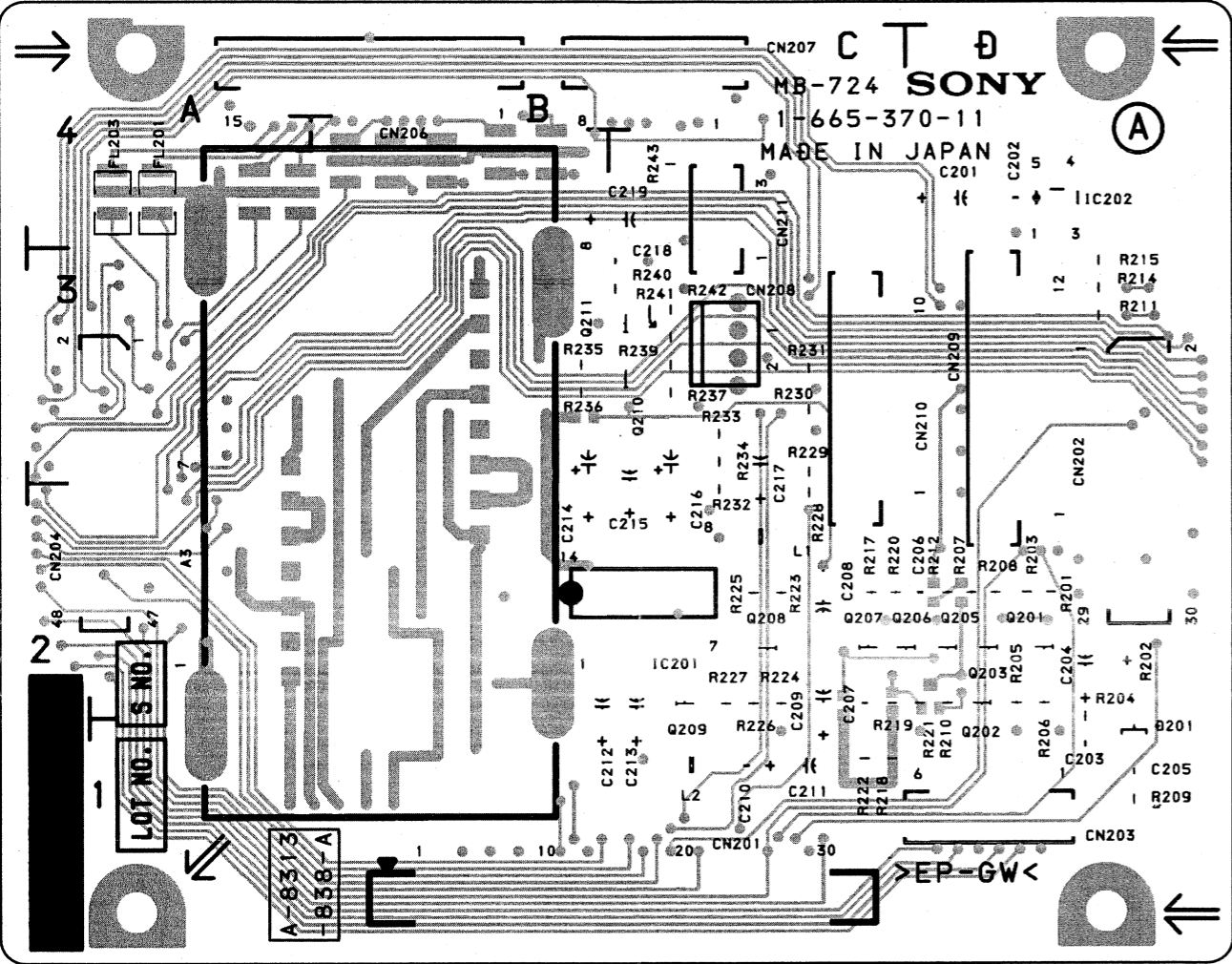


CN-1462 A SIDE
1-665-374-11

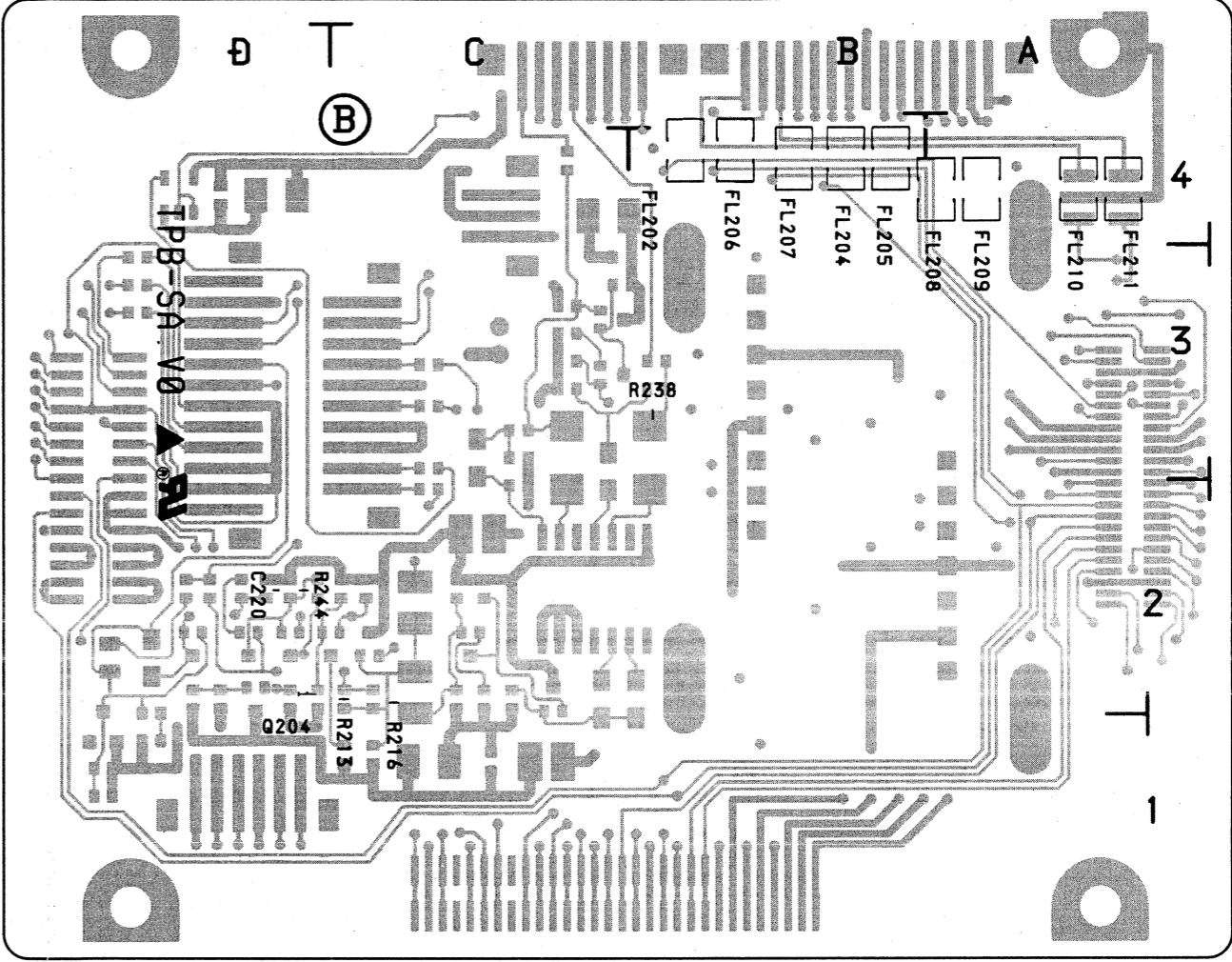


CN-1462 B SIDE
1-665-374-11





MB-724 A SIDE
1-665-370-11

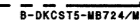


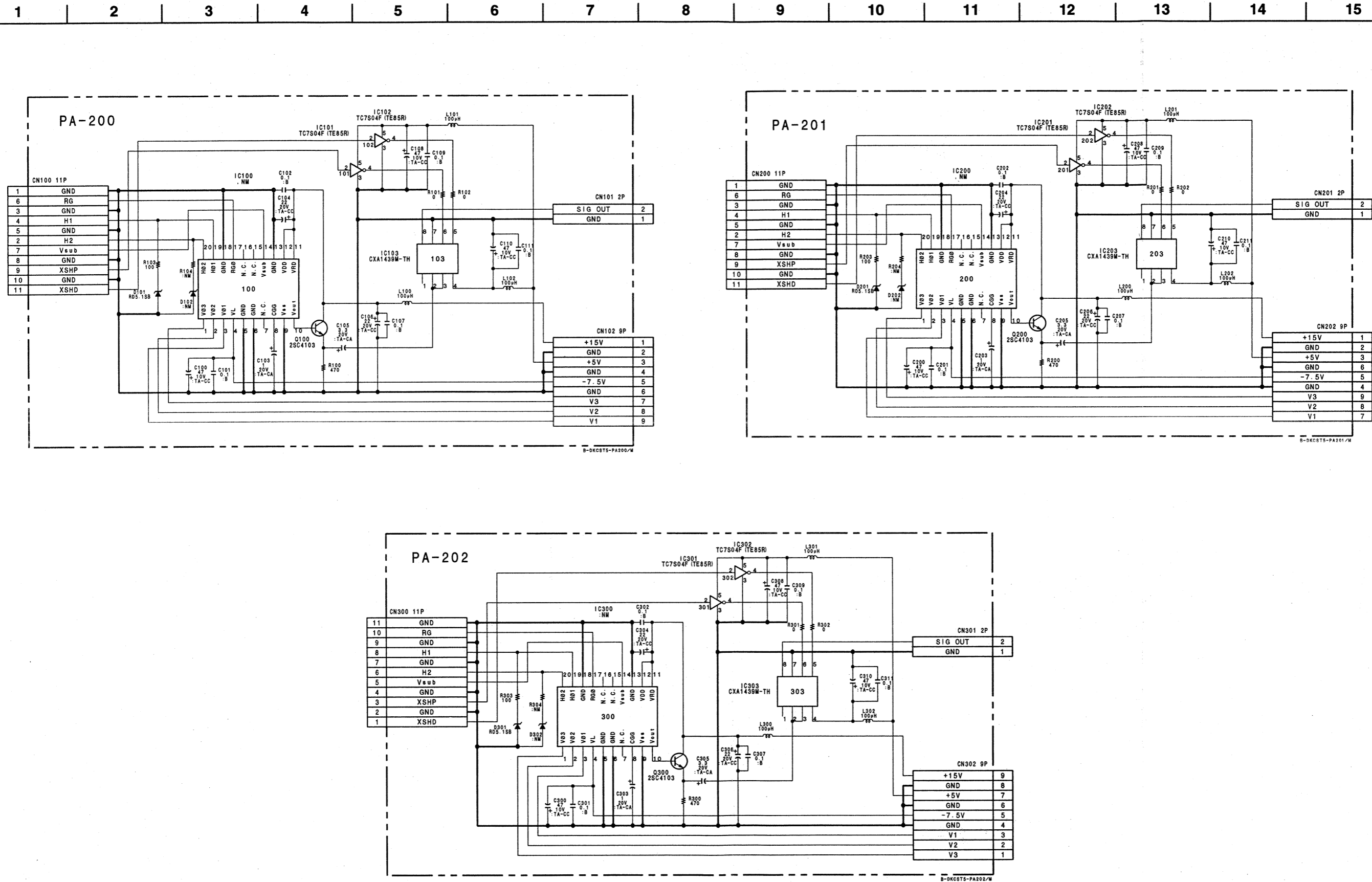
MB-724 B SIDE
1-665-370-11

MB-724 BOARD

CN201	C1	* FL209	A4
CN202	D2	* FL210	A4
CN203	D1	* FL211	A4
CN204	A2	IC201	C2
CN206	B4	IC202	D4
CN207	C4	L1	C2
CN208	C3	L2	C1
CN209	D3	Q201	D2
CN210	C3	Q202	D2
D201	D1	Q203	D2
FL201	A4	* Q204	D2
* FL202	B4	Q205	D2
FL203	A4	Q206	C2
* FL204	B4	Q207	C2
* FL205	B4	Q208	C2
* FL206	B4	Q209	C2
* FL207	B4	Q210	C3
* FL208	A4	Q211	C3

* B SIDE

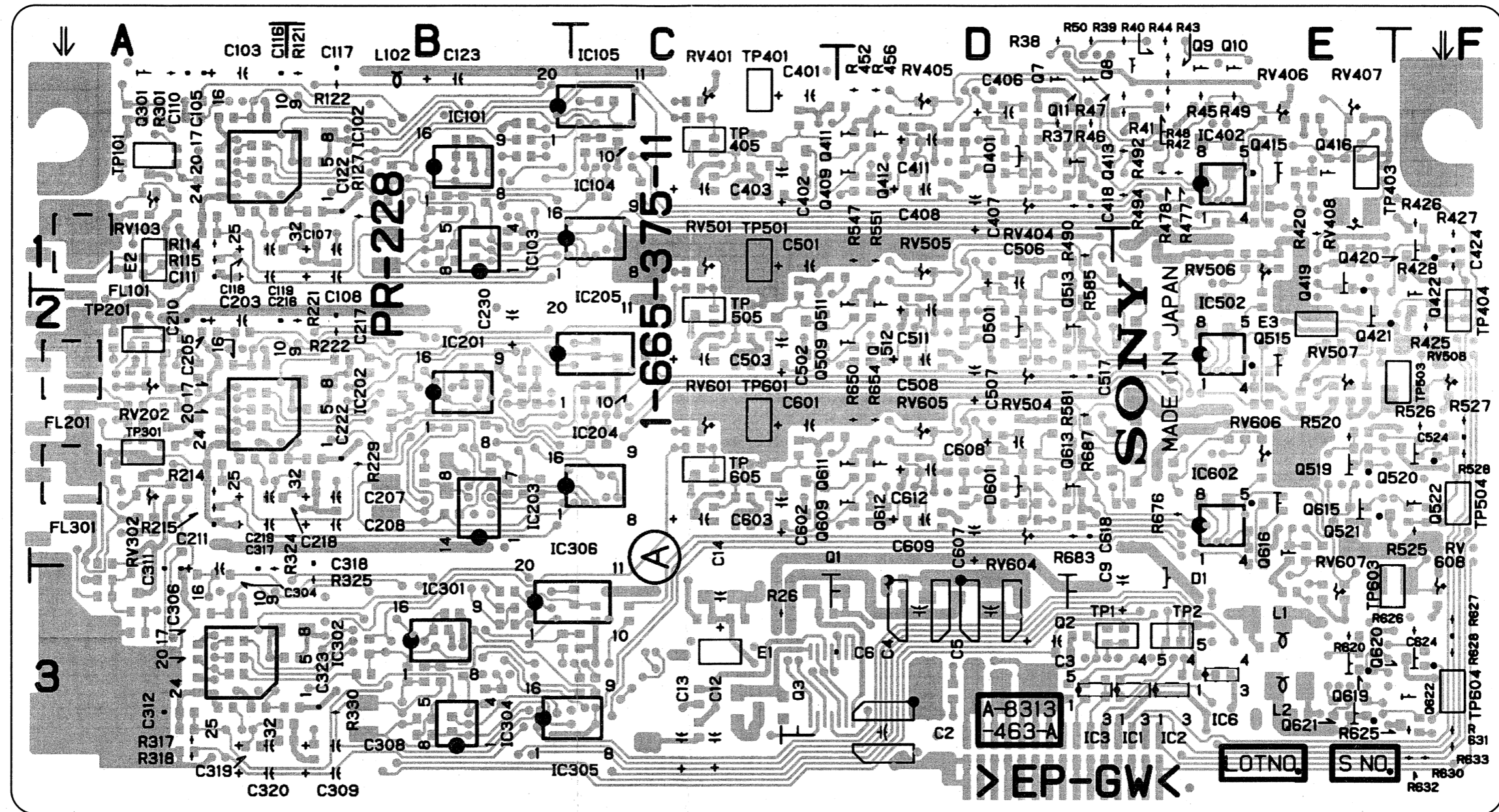




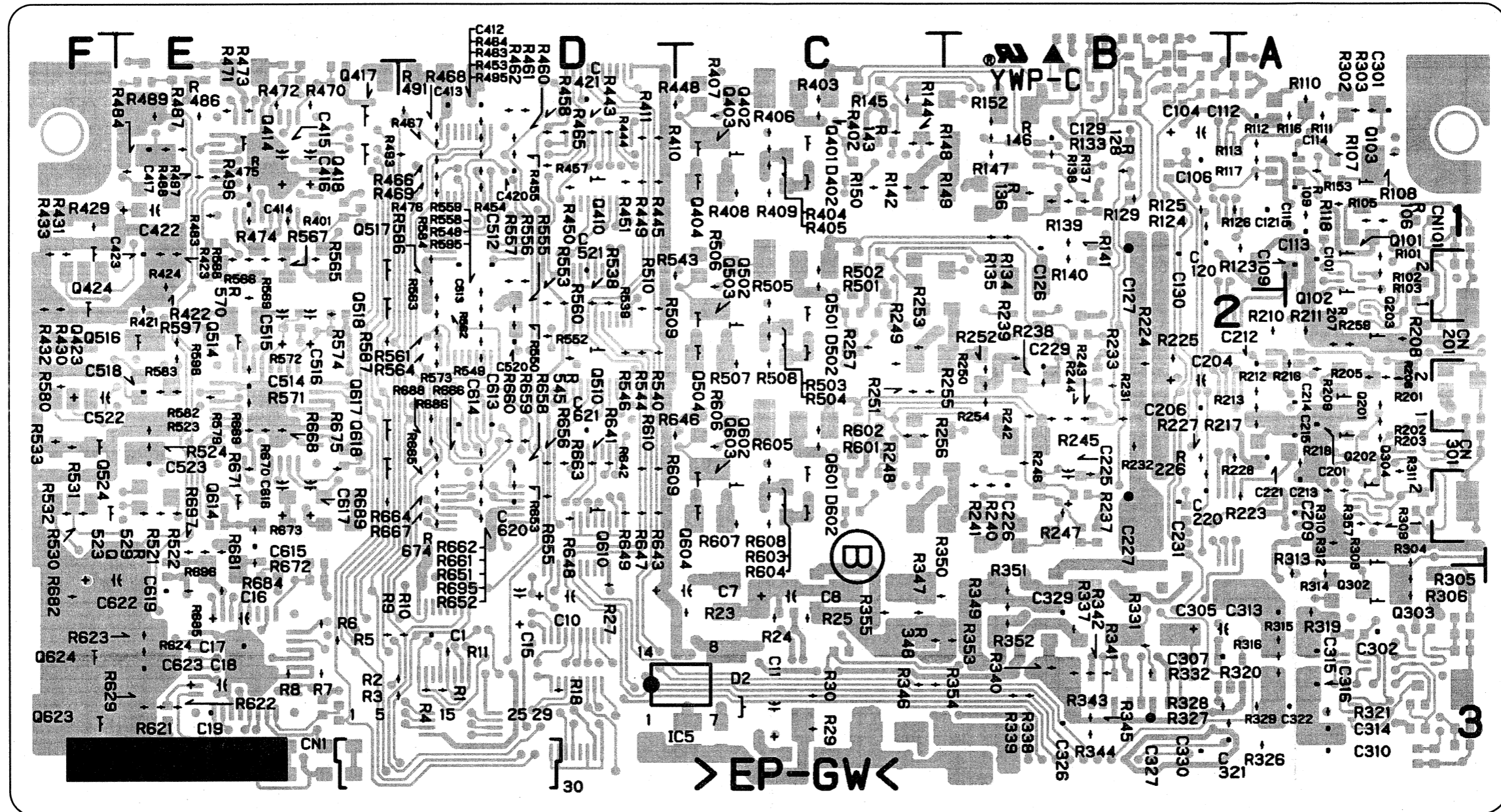
PR-228 BOARD

* CN1	D3	* Q423	F2
* CN101	A1	* Q424	F1
* CN201	A2	* Q501	C2
* CN301	A2	* Q502	C2
D1	E3	* Q503	C2
* D2	C3	* Q504	C2
D401	D1	* Q509	D2
* D402	C1	* Q510	D2
D501	D2	* Q511	D2
* D502	C2	* Q512	D2
D601	D2	* Q513	D2
* D602	C2	* Q514	E2
E1	C3	* Q515	E2
E2	A1	* Q516	E2
E3	E2	* Q517	E1
FL101	A1	* Q518	E2
FL201	A2	* Q519	E2
FL301	A2	* Q520	F2
IC1	E3	* Q521	E2
IC2	E3	* Q522	F2
IC3	D3	* Q523	F2
* IC5	C3	* Q524	F2
IC6	E3	* Q601	C2
IC101	B1	* Q602	C2
IC102	A1	* Q603	C2
IC103	B1	* Q604	C2
IC104	C1	* Q609	D2
IC105	C1	* Q610	D2
IC201	B2	* Q611	D2
IC202	A2	* Q612	D2
IC203	B2	* Q613	D2
IC204	C2	* Q614	E2
IC205	C2	* Q615	E2
IC301	B3	* Q616	E2
IC302	A3	* Q617	E2
IC304	B3	* Q618	E2
IC305	C3	* Q619	E3
IC306	C3	* Q620	F3
IC402	E1	* Q621	E3
IC502	E2	* Q622	F3
IC602	E2	* Q623	F3
L1	E3	* Q624	F3
L2	E3	RV103	A1
L102	B1	RV202	A2
Q1	C3	RV302	A2
Q2	D3	RV401	C1
Q3	C3	RV404	D1
Q7	D1	RV405	D1
Q8	E1	RV406	E1
Q9	E1	RV407	E1
Q10	E1	RV408	E1
Q11	D1	RV501	C1
* Q101	A1	RV504	D2
* Q102	A2	RV505	D1
* Q102	A2	RV506	E1
* Q103	A1	RV507	E2
* Q201	A2	RV508	F2
* Q203	A2	RV601	C2
Q301	A1	RV604	D2
* Q302	A2	RV605	D2
* Q303	A3	RV606	E2
* Q304	A2	RV607	E3
* Q401	C1	RV608	F3
* Q402	C1	TP1	E3
* Q403	C1	TP2	E3
* Q404	C1	TP101	A1
Q409	D1	TP201	A2
* Q410	D1	TP301	A2
Q411	D1	TP401	C1
Q412	D1	TP403	E1
Q413	D1	TP404	F2
* Q414	E1	TP405	C1
Q415	E1	TP501	C1
Q416	E1	TP503	F2
* Q417	E1	TP504	F2
* Q418	E1	TP505	C2
Q419	E1	TP601	C2
Q420	F1	TP603	E3
Q421	E2	TP604	F3
Q422	F2	TP605	C2

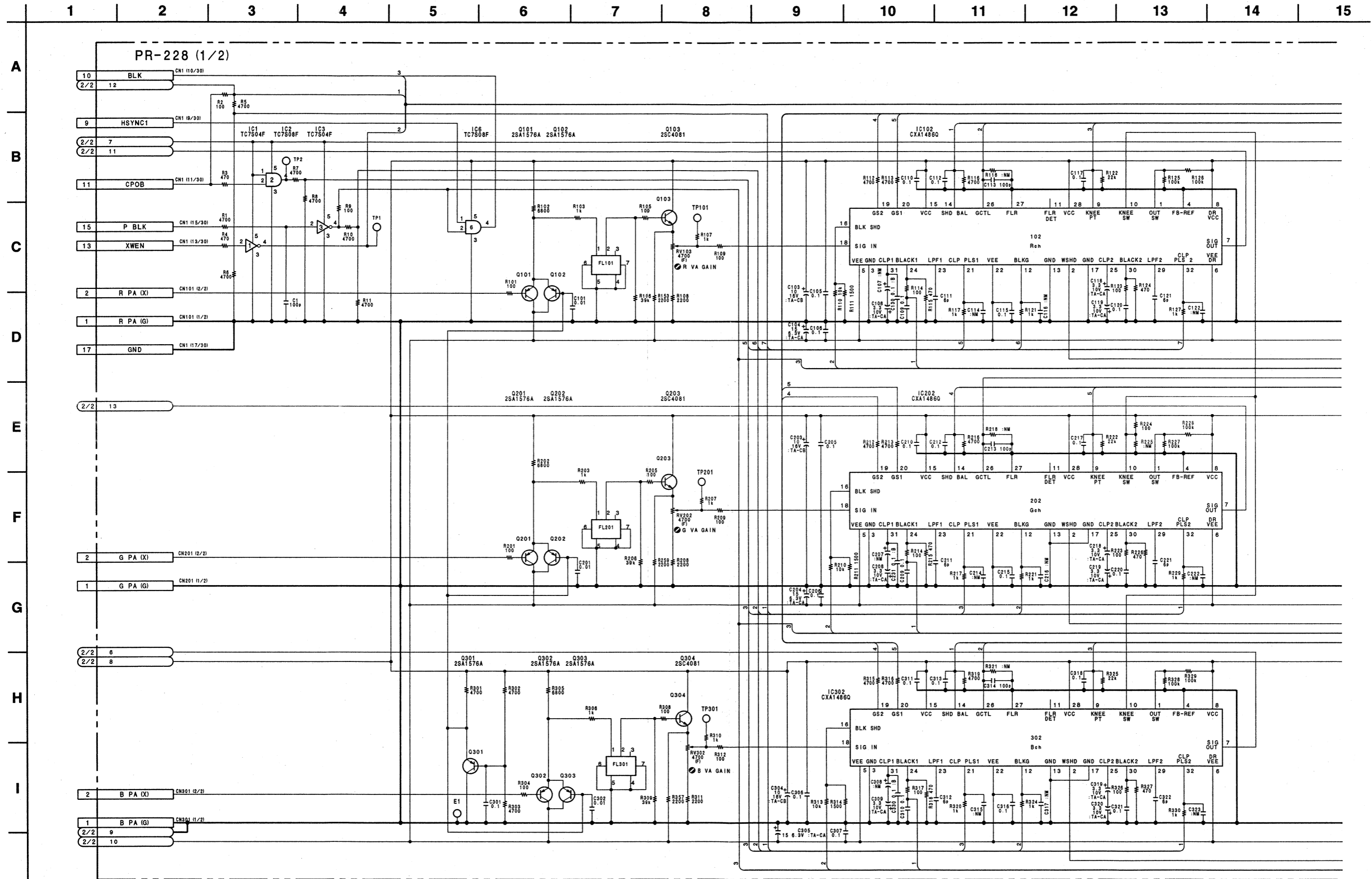
* B SIDE



PR-228 A SIDE
1-665-375-11



PR-228 B SIDE
1-665-375-11



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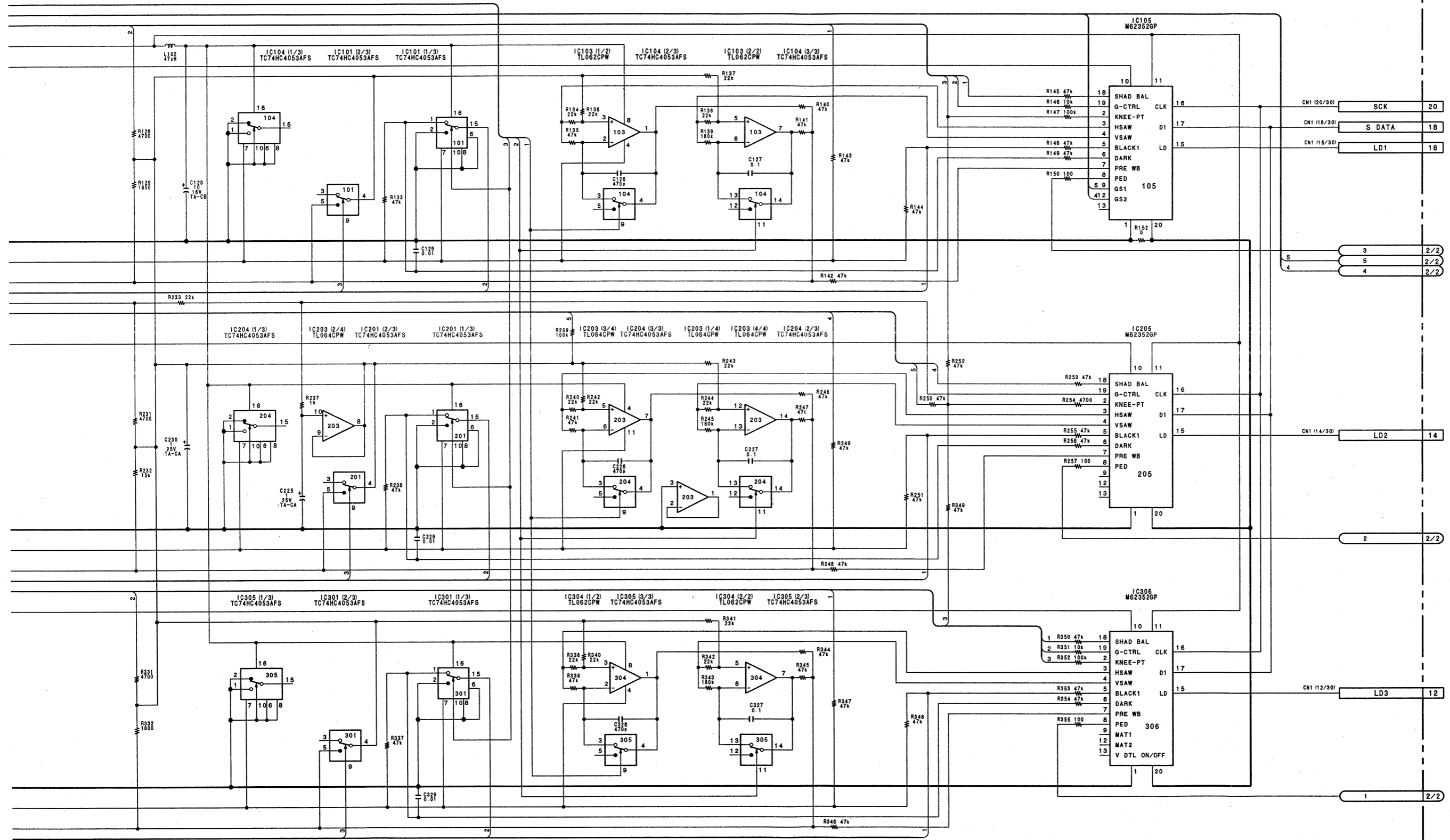
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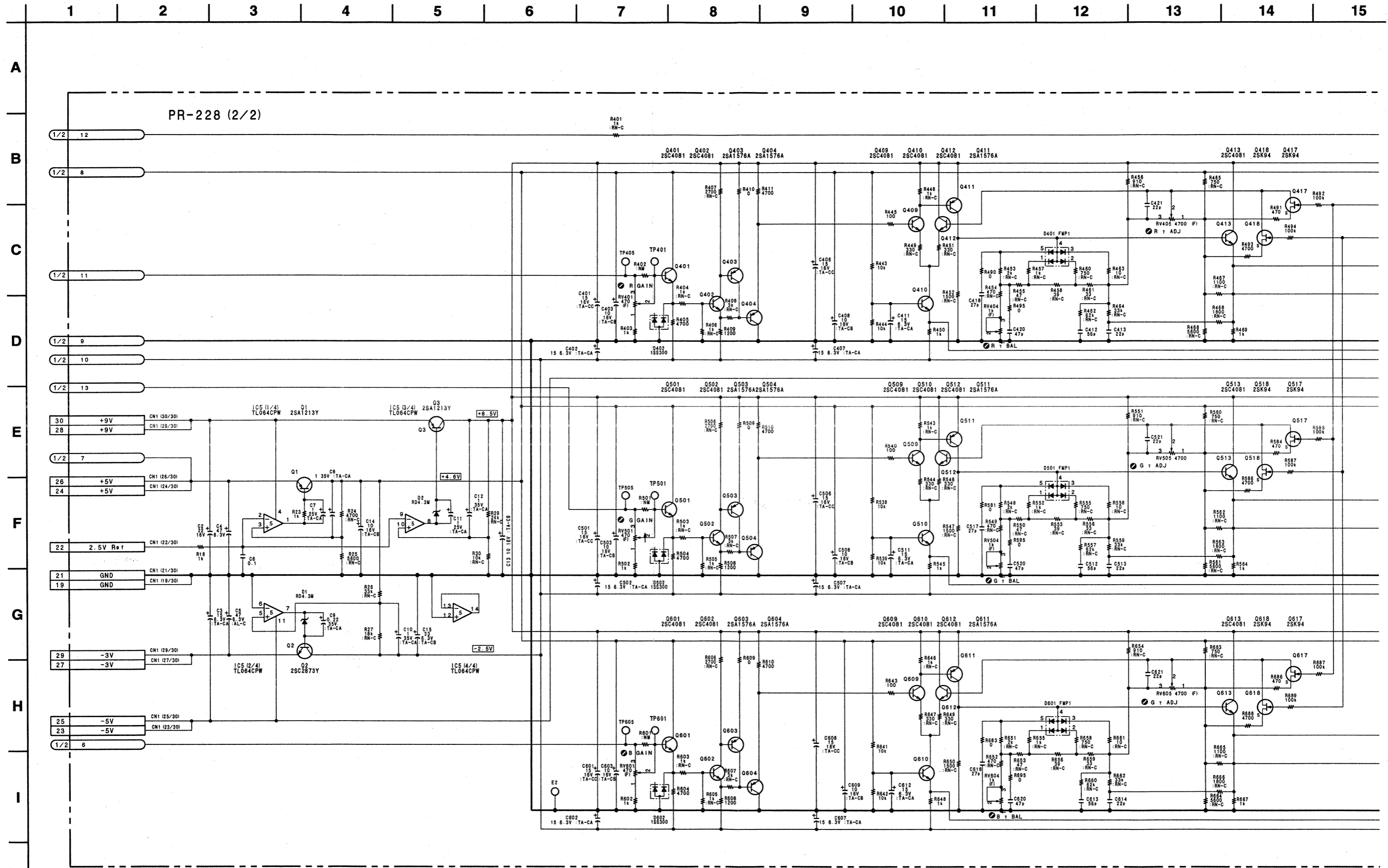
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PR-228 (1/2)



B-DK875-PR228/M



B-DKST5-PR228/M

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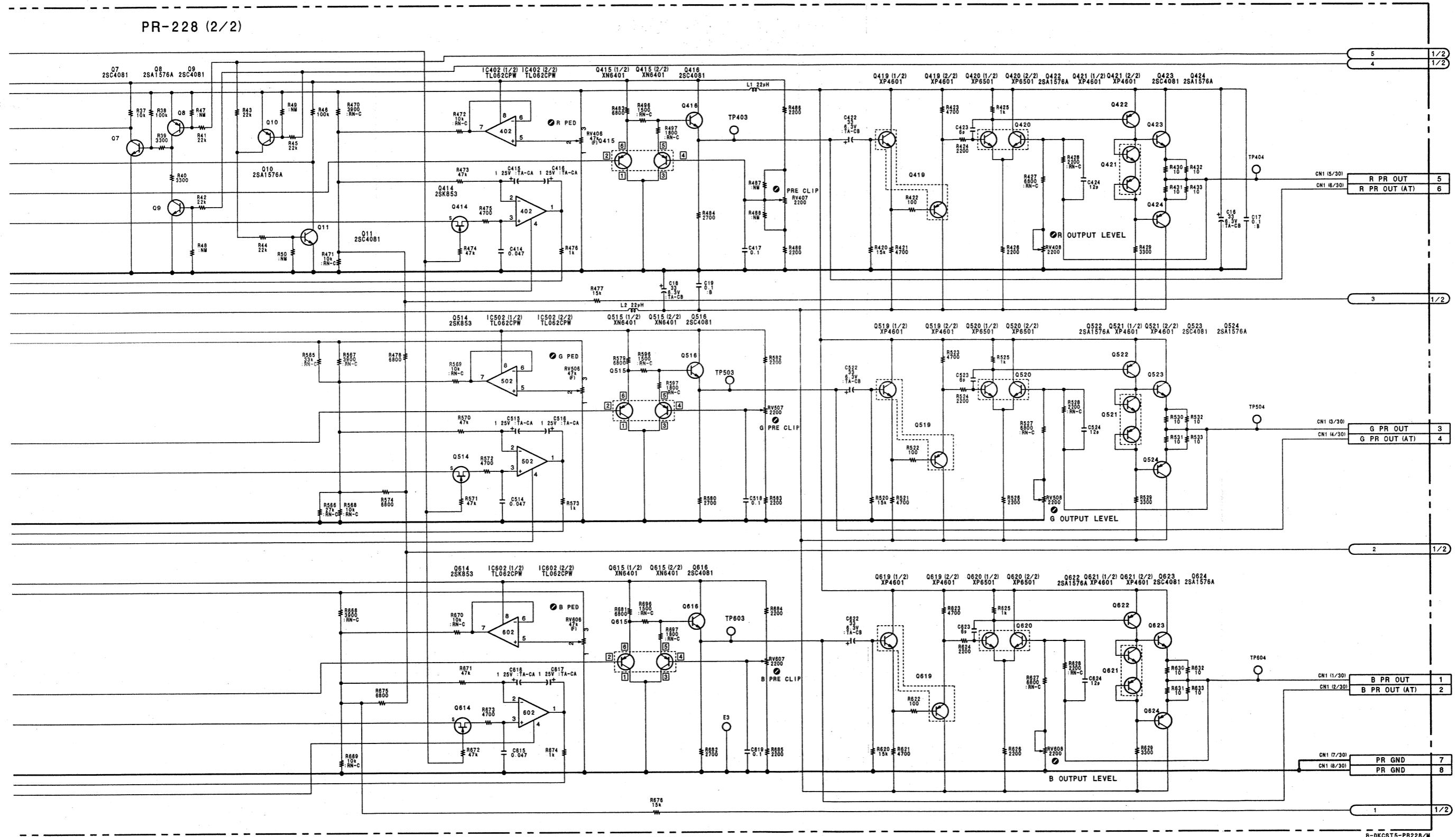
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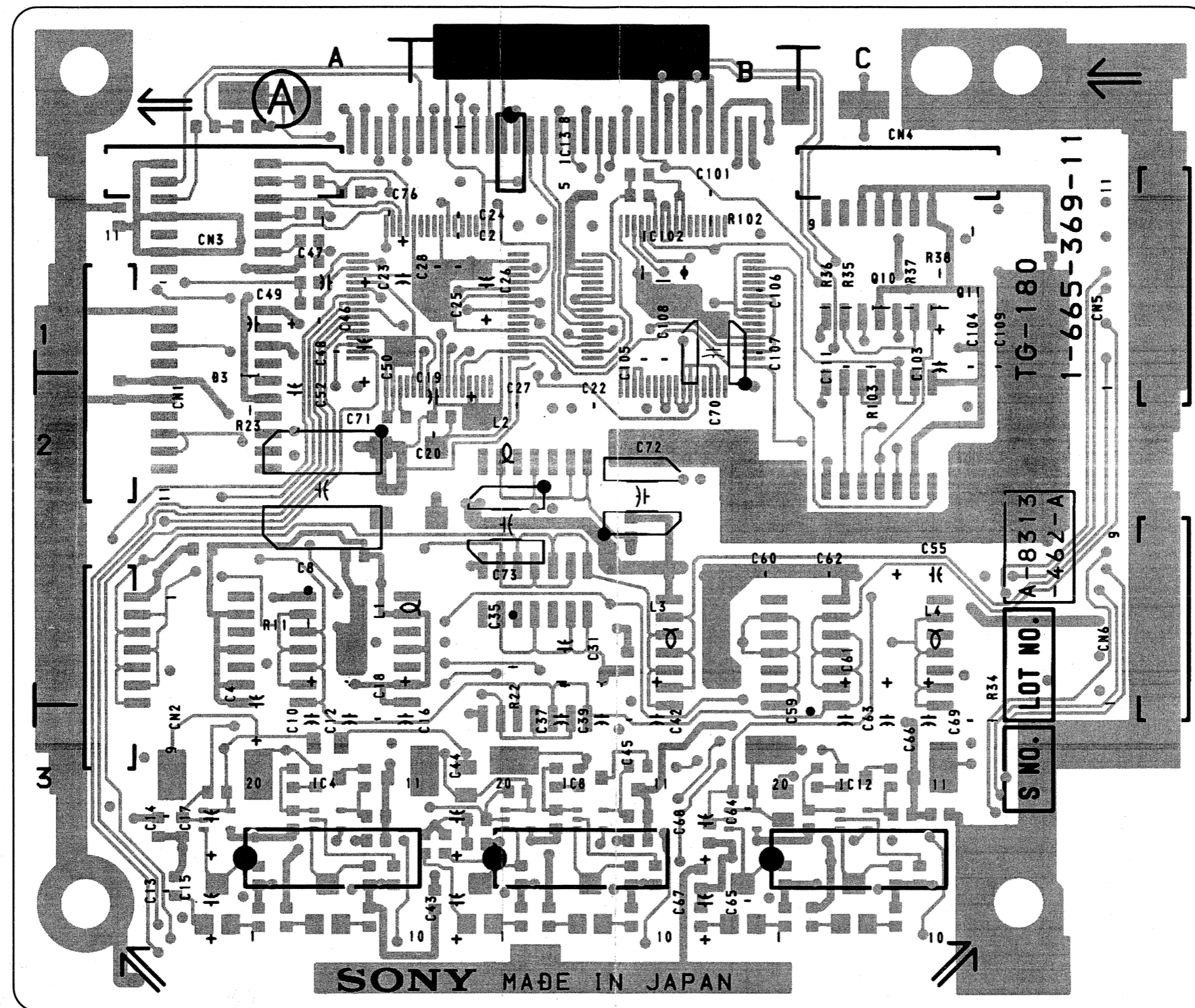
PR-228 (2/2)



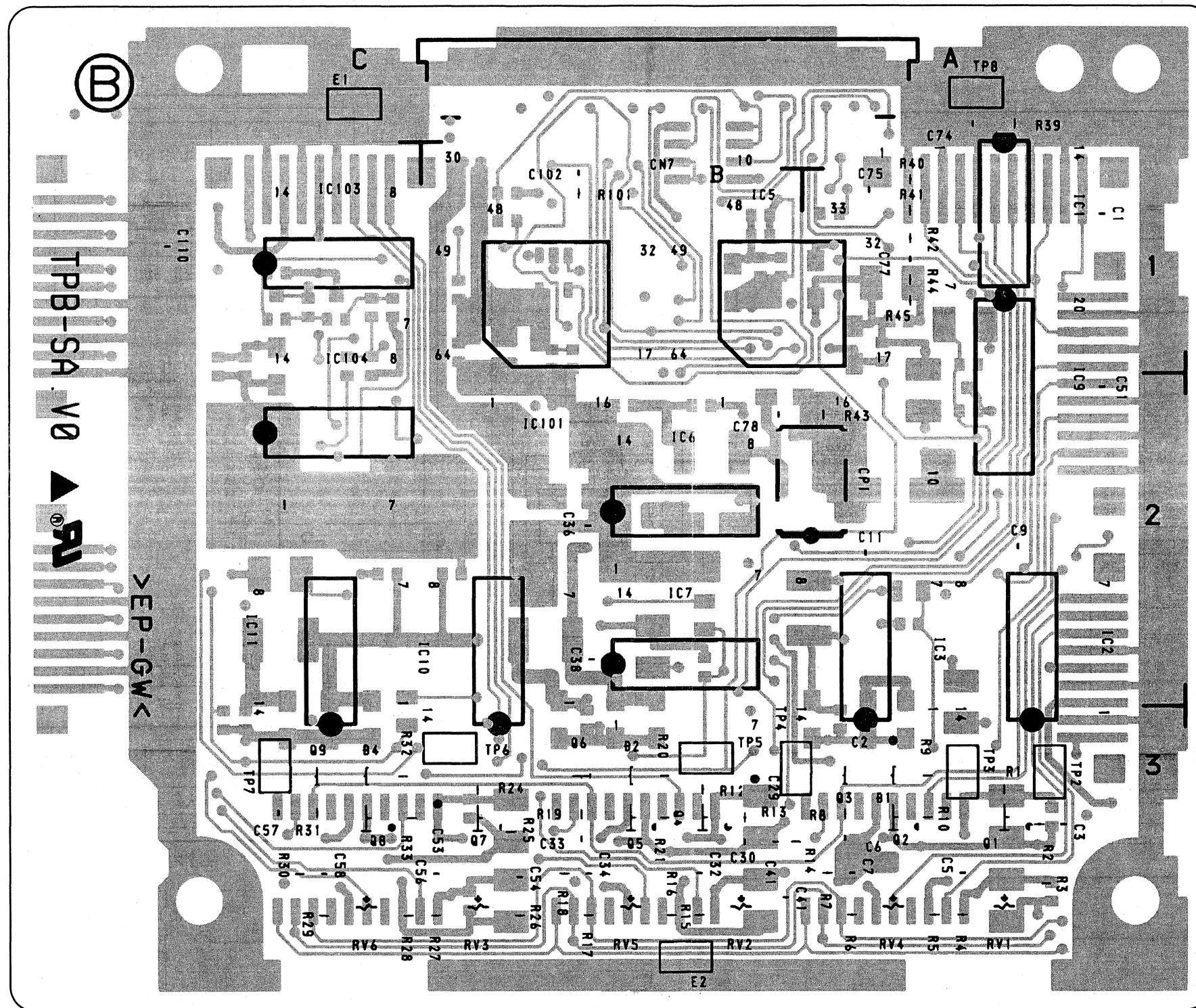
TG-180 BOARD

CN1	A2
CN2	A2
CN3	A1
CN4	C1
CN5	C1
CN6	C2
*CN7	B1
*CP1	A2
*D1	A3
*D2	B3
D3	A2
*D4	C3
*E1	C1
*E2	B3
*IC1	A1
*IC2	A2
*IC3	A2
*IC4	A3
*IC5	B1
*IC6	B2
*IC7	B2
*IC8	B3
*IC9	A2
*IC10	B2
*IC11	C2
IC12	C3
IC13	B1
*IC101	B1
IC102	B1
*IC103	C1
*IC104	C2
L1	A2
L2	B2
L3	B2
L4	C2
*Q1	A3
*Q2	A3
*Q3	A3
*Q4	B3
*Q5	B3
*Q6	B3
*Q7	B3
*Q8	C3
*Q9	C3
Q10	C1
Q11	A1
*RV1	A3
*RV2	B3
*RV3	B3
*RV4	A3
*RV5	B3
*RV6	C3
*TP2	A3
*TP3	A3
*TP4	B3
*TP5	B3
*TP6	B3
*TP7	C3
*TP8	A1

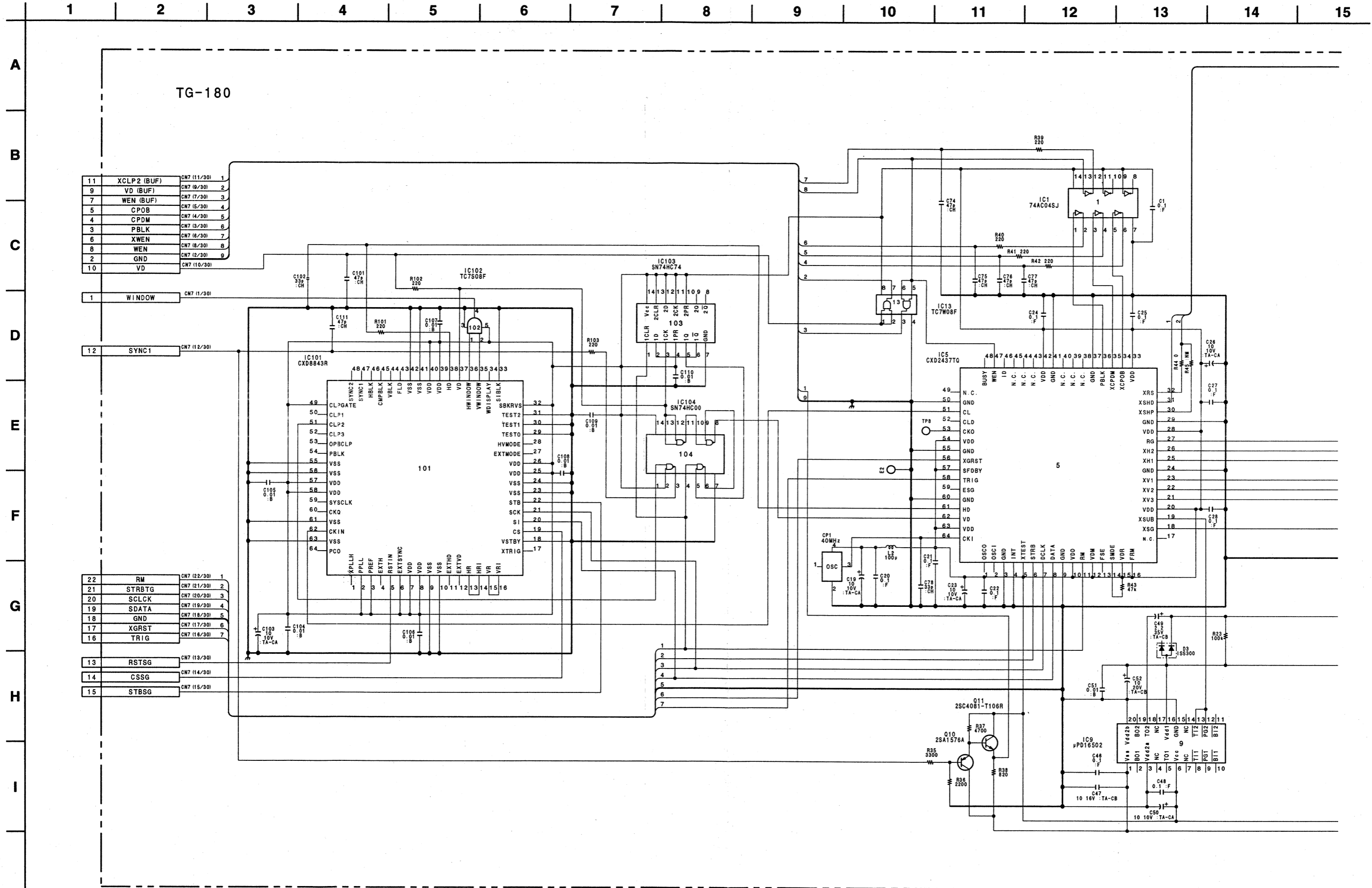
* B SIDE



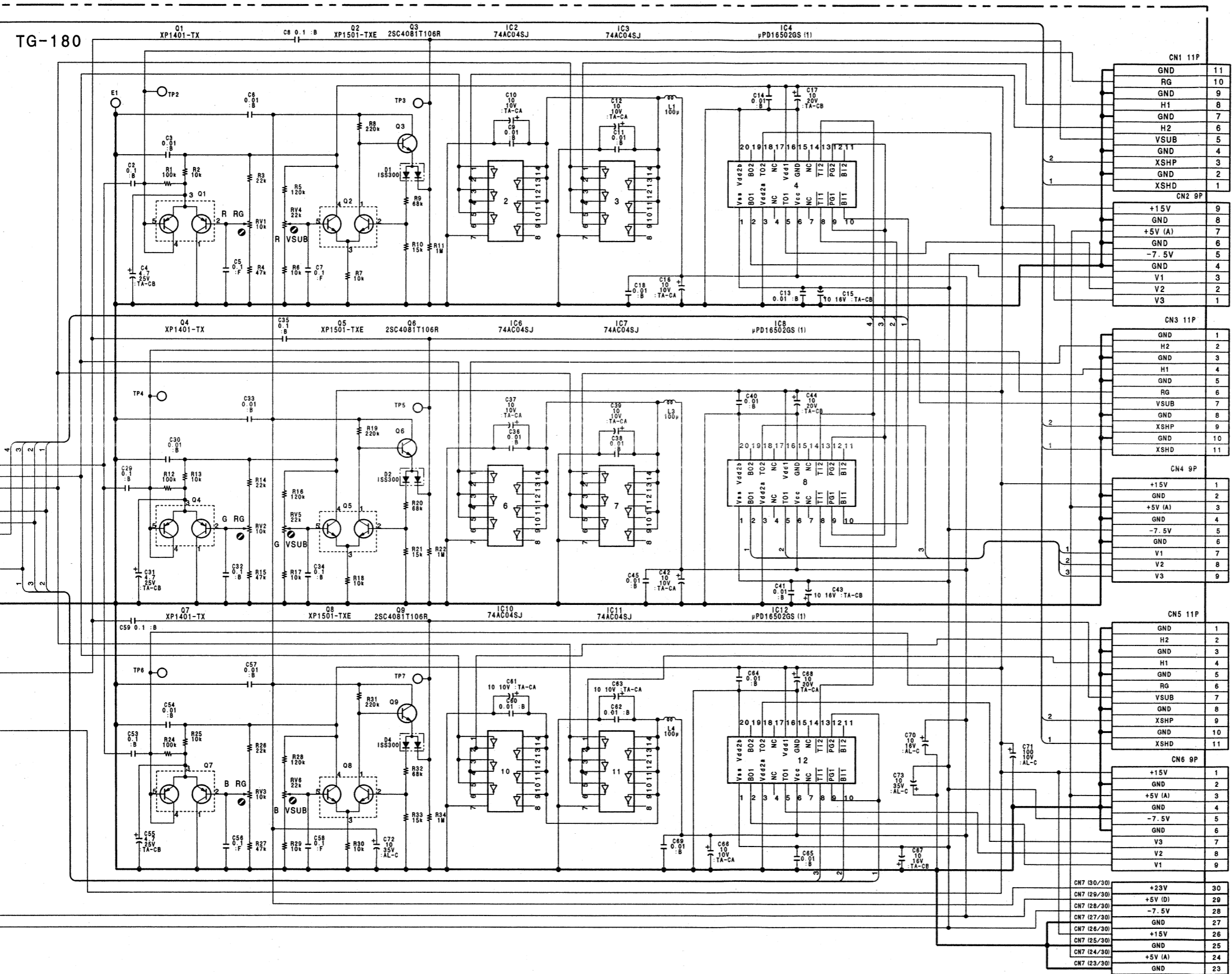
TG-180 A SIDE
1-665-369-11



TG-180 B SIDE
1-665-369-11



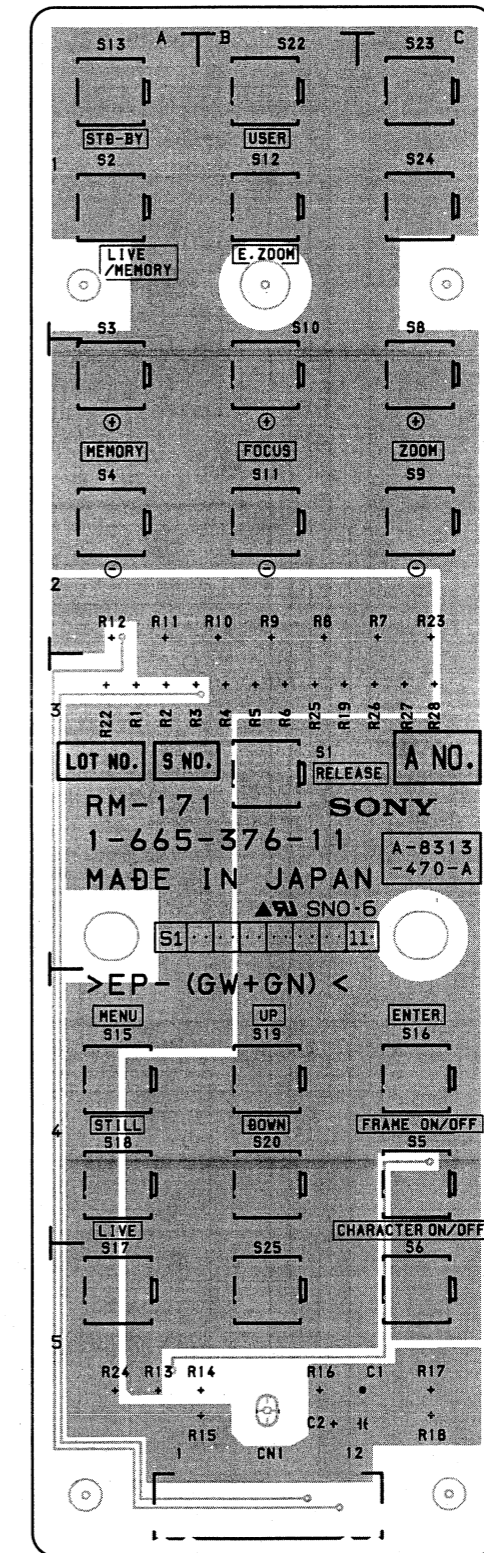
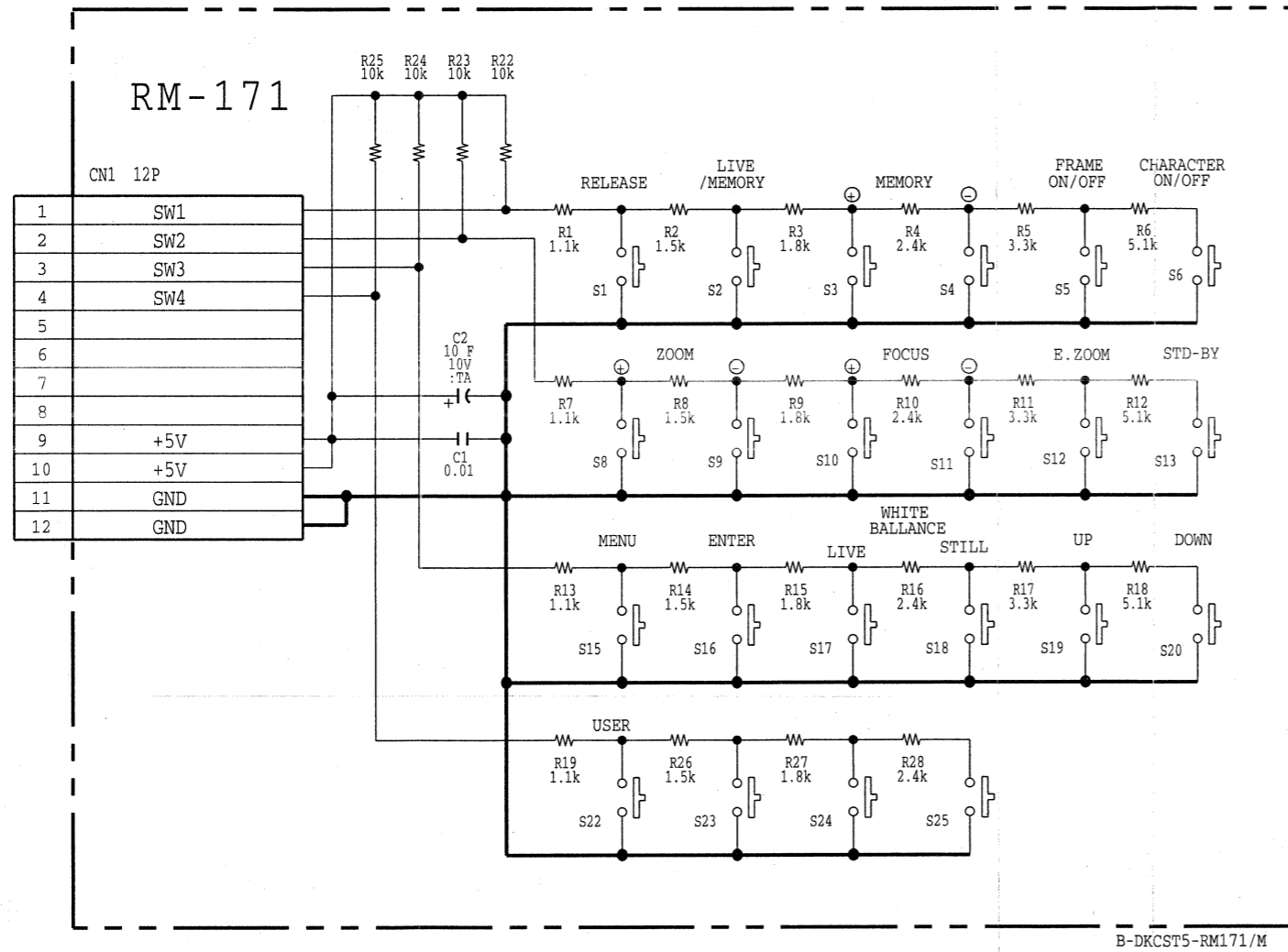
TG-180



B-DKCS75-TG180/M

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

A
B
C
D
E
F
G
H
I



RM-171 A SIDE
1-665-376-11